

# MODERN Machine Shop

JANUARY, 1954

Survey by Leading  
Motor Manufacturer Proves

**NORMA-HOFFMANN**

*Prelubricated*

**"CARTRIDGE" BEARINGS**

Slash Motor  
**UPKEEP  
COSTS**



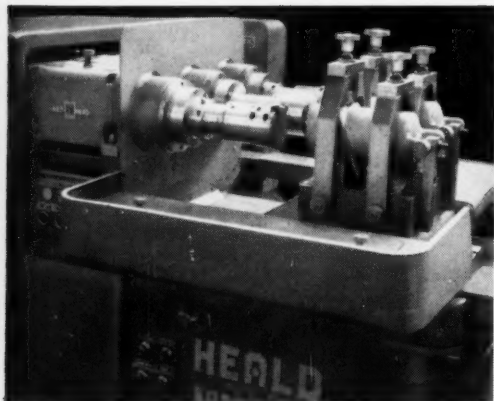


**Heald  
Bore-Matic**

***SPEEDS OUTPUT***

**of ironer cylinders**

**67%**



• WHEN YOU COMBINE high cycle speeds, multiple boringheads and automatic indexing, you'll get faster, better production every time. The Heald Model 321 Bore-Matic shown at the left is a typical example.

By performing both roughing and finishing operations on two parts at a single loading, this machine speeded up the job by 67%. Three boringheads are used — the outer two for roughing the cast iron cylinders, and the center one for the finishing operation. A two station fixture on the cross slide indexes the work automatically. Parts are located in a Vee block fixture, with quick-acting clamps for easy loading and unloading.

Remember — when it comes to precision finishing, it pays to come to Heald.

Internal and Rotary  
Surface Grinding Machines  
and Bore-Matics



**THE HEALD MACHINE COMPANY**

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



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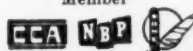
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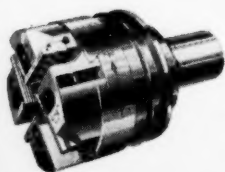
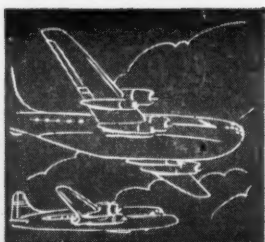
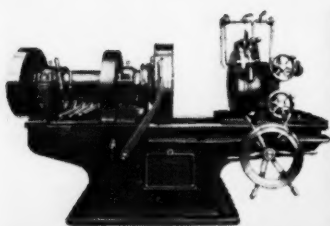
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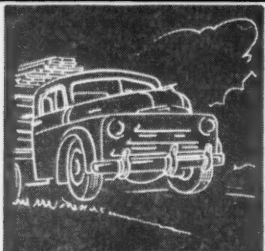
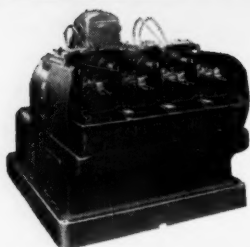
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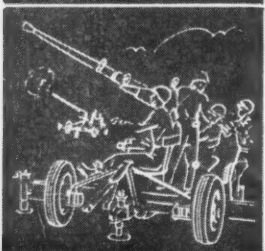
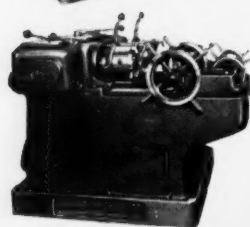


# LANDIS THREADS

... FOR DEFENSE AND PEACE

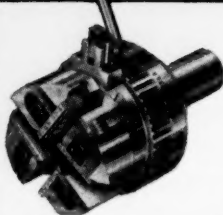
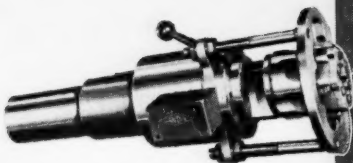


Threads to open bomb doors, or secure warheads on naval rockets—threads to help steer pleasure cars, or to adjust microscopes in research. All of these are produced by one or another of the many types of Landis Threading Equipment, equally adapted to making America strong in war, or building a land of plenty in peace.



In addition, we are ready to help wherever we can with original thread design, development of threading methods, or adaptation of threading equipment for production. Send us your specifications, or our representative will call at your convenience on request.

## LANDIS Machine CO. WAYNESBORO PA., U.S.A.



309

# Hammond

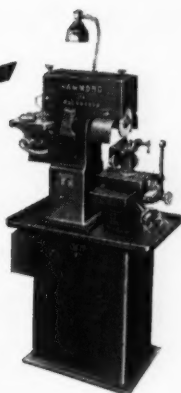
OF KALAMAZOO

## CARBIDE TOOL

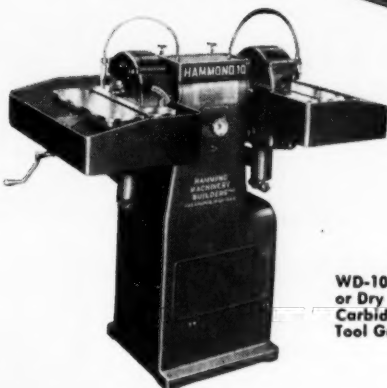
AND

## CHIP BREAKER GRINDERS

*Save*  
TIME  
TOOLS  
WHEELS



CB-77 Chip  
Breaker and  
Diamond  
Finishing  
Grinder



WD-10 Wet  
or Dry 10"  
Carbide  
Tool Grinder



14-WD Wet or Dry 14"  
Carbide Tool Grinder

Hammond Carbide Tool Grinders will soon pay for themselves thru greater wheel economy, longer tool life and **FASTER** grinding. They relieve toolroom bottlenecks and step up production. Write for Carbide Grinder Catalog 225.

*Hammond*  
*Machinery Builders* INC.

1615 DOUGLAS AVE. • KALAMAZOO, MICH.

**New • Fast • Proven**

# **LOW COST**

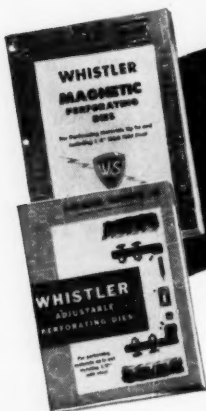
**methods for  
PERFORATING  
and NOTCHING  
SHEET METALS**

## **Whistler MAGNETIC Dies**

at work in large inclinable press. Magnetized retainers hold the units. No bolting required. A fast, economical method in making up a punch and die set for short or long runs. All parts re-usable.

## **Whistler ADJUSTABLE Dies**

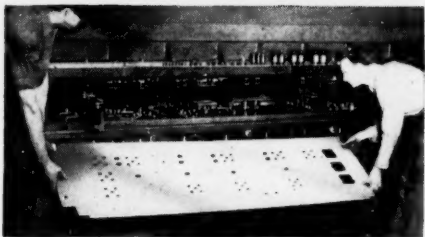
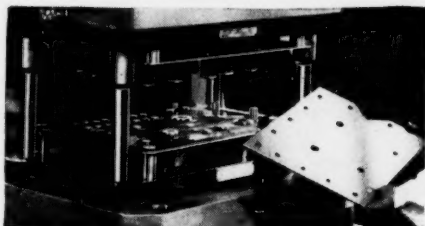
on perforating and notching job, using Tee slotted die set. With Whistler Adjustable Punch and Die units production starts within hours instead of weeks. Last minute job changes made quickly.



● Here are the complete details with prices and application illustrations. Send for these catalogs. No obligation.

## **REDUCE DIE COSTS**

All units and parts are interchangeable and used repeatedly in different arrangements. **INCREASE PRESS PRODUCTION**—Down time is minutes as compared to hours for change-over. For precision work in all types and sizes of presses. **START PRODUCTION AT ONCE.** Pierce materials up to 1/4" thick mild steel. Standard sizes and shapes available up to 3 inches. Special sizes to order.



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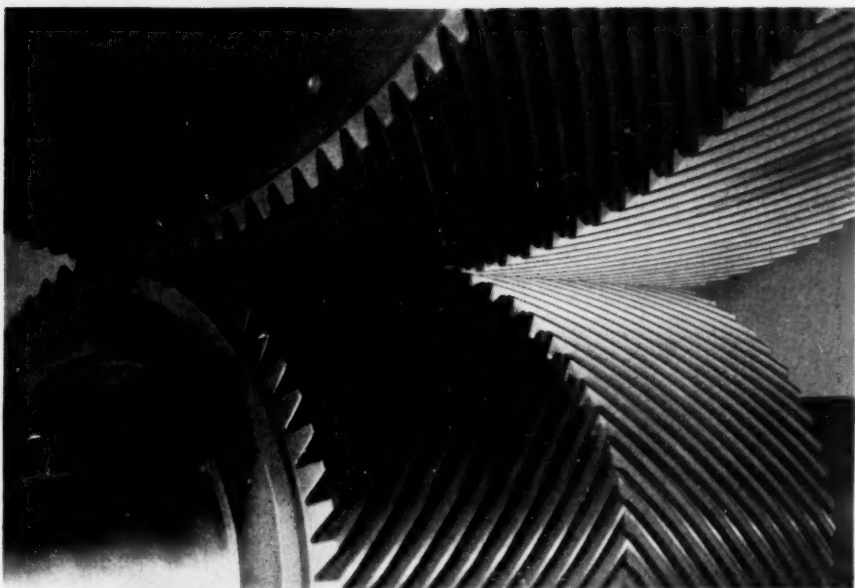
CITY \_\_\_\_\_

ZONE \_\_\_\_\_

STATE \_\_\_\_\_

# **S. B. WHISTLER & SONS, Inc.**

*Adjustable, Magnetic, Custom and Cam Dies for all Industry*  
**740 Military Road, Buffalo 23, N. Y.**



## These gears INHERIT precision

The precision in Farrel® herringbone gears is passed on from the machine on which the gears are made—the Farrel-Sykes Gear Generator.

The accuracy inherent in the operating principle of the machine—"precision generation"—gives the gears extremely accurate tooth spacing, profile and helix angle. Because of this, you can be sure that Farrel herringbone gears will operate smoothly, quietly and efficiently over a long service life.

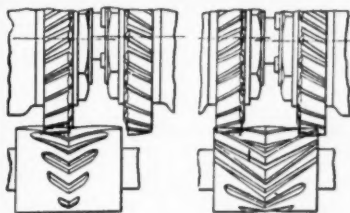
These precision-generated gears are made in any size from 1/4" to 20'0" diameter, for any power capacity and speed. Write for further information.

**FARREL-BIRMINGHAM COMPANY, INC.**  
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-883



### PRECISION GENERATION

The Farrel-Sykes gear machine is equipped with two cutters mounted on a single carriage. The cutters reciprocate, each ending its stroke at the center of the blank. As they cut, they twist to generate the helices and also slowly revolve in unison with the gear blank to generate the tooth contours precisely.



Inspecting a special gage on a Taft-Peirce 24" x 36" Granite Surface Plate.

## New Taft-Peirce GRANITE SURFACE PLATE Keeps Measurements On The Level

**FOR PRECISION MEASUREMENTS** that require the ultimate in smooth flat surfaces, Taft-Peirce now offers something new in surface plates. A Blue-White Granite Surface Plate. Made of a granite new to toolrooms, it's harder, more wear-resistant, easier to use and care for.

**SURFACE ACCURACY** is not subject to distortion. Plate is free from all residual stresses. Temperature changes or shock can't warp it.

**SMOOTHER**, its blue-white grain is extremely fine and even — yet natural pores assure free movement of tools and instruments.

**PRACTICALLY INDESTRUCTIBLE**, heavy pointed objects dropped on the surface barely powder point of impact. No humps or burrs are raised to impair accuracy. Unique grain direction running 45° to working surface of plate prevents cracking, chipping, or breaking.

**RUST-PROOF**, no oiling or covers necessary.

**LOW POROSITY** makes moisture absorption negligible. Tools or work left on this granite surface are not subject to rust.

**NON-ABRASIVE**, the extra-fine grain won't impregnate readily with dirt or grit particles to cause abrasion.

Surface is easily wiped clean and free of foreign matter.

**NON-MAGNETIC**, it won't deflect instruments. Nor will its soft blue-white color glare or cause disturbing reflections.

**ACCURATELY GROUND AND LAPPED**, backed by more than 75 years of experience in making precision products, Taft-Peirce Granite Surface Plates are the newest addition to a famous line of layout and inspection equipment.

Write for price list today.

For more information on surface plates and many other items, get your copy of the new Taft-Peirce Handbook.

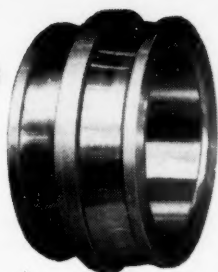


*T-P means  
Top Precision*

THE TAFT-PEIRCE MANUFACTURING COMPANY · WOONSOCKET, RHODE ISLAND



# SKF



# RACES

## *Against Time...*

with the

## GISHOLT NO. 24 HYDRAULIC AUTOMATIC LATHE

When it comes to fast production of top quality spherical roller bearing races, SKF doesn't fool.

These big Gisholt No. 24 Hydraulics remove 34 lbs. of metal in two operations in a total of only 2.80 minutes' machining time on each of two machines. All cutting is on 52100 bearing steel and done at speeds of 325 to 350 f.p.m.

Speed is important, of course. But precision is the governing factor. How the Gisholt No. 24 does the job is a story that might mean real savings for you, too.

The No. 24 Hydraulic Automatic Lathe is a larger version of the famous No. 12 that has an outstanding success record on hundreds of jobs. If you have large volume precision work up to 24" diameter, the Gisholt No. 24 is the machine to investigate. Write for full information.

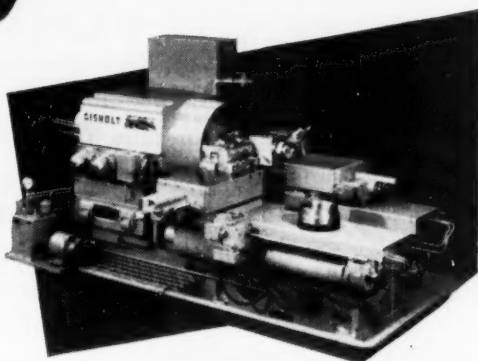
### GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

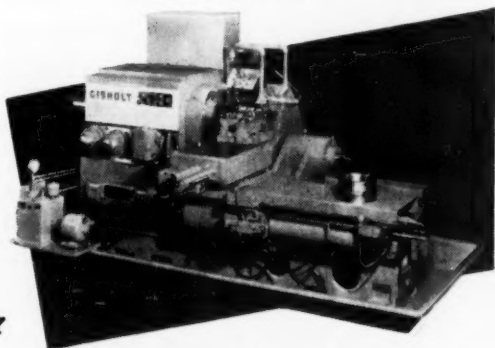
THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



TURRET LATHES • AUTOMATIC LATHES  
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



**First Operation:** Chucked on OD with 3-jaw hydraulic chuck, part is turned up to the jaws, faced, chamfered, bored and bore radius formed. Cam relief on rear tool block turns boring bit clear of workpiece as it is withdrawn.



**Second Operation:** Part held on expanding arbor by hydraulic pressure is finish turned, faced, chamfered and bore radius formed. Special rocker arm type carriage at rear tips in shaving tools to form both roller grooves with feed of .003" to .0045."

# Keeping the cost of BIG

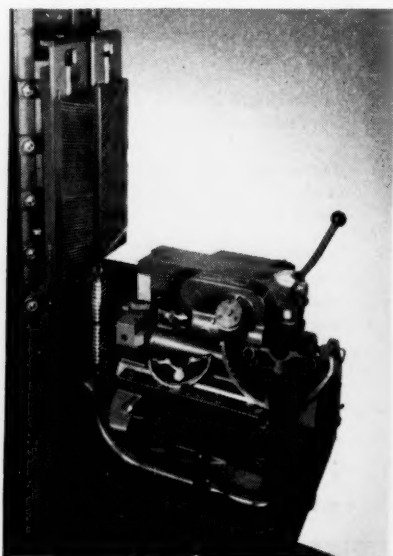
In the metalworking industry, big families of parts can eat profits out of house and home. Nevertheless, they can prove to be an asset if they're studied carefully from the viewpoint of reducing production costs. Cincinnati Application Engineers have been doing this for years with large and small quantities of similar parts that can be machined by the broaching process. Examples of their work are illustrated here. Do they suggest new ideas for your shop? ¶ Perhaps you have a high-cost family of parts—those having similar machining operations. Let us know about them. And if you would like to have more data on CINCINNATI Hydro-Broach Machines, refer to Sweet's Catalog File for Mechanical Industries, or write to us for publications M-1709-1 and M-1745.

**THE CINCINNATI MILLING MACHINE CO.**  
**CINCINNATI 9, OHIO**



## **FAMILY OF 90 CAMS**

Part name.....	Cams (90 sizes and shapes)
Material .....	Cast iron
Operation.....	Broach half bore and parting face
Production.....	140 per hour
Equipment.....	CINCINNATI No. 5-54 Single Ram Vertical Hydro-Broach completely equipped to broach 90 sizes and shapes of cams



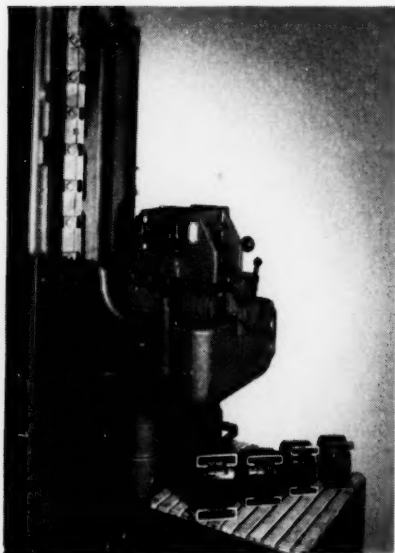
# CINCIN

**MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING**

# FAMILIES at a minimum

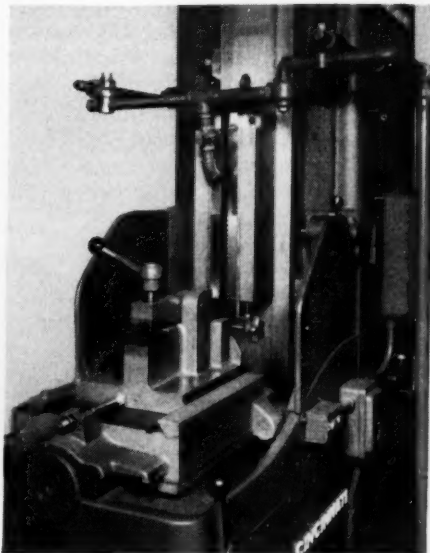
## FOUR IN THIS ONE

Part name... Housings  
Material .... Cast iron  
Operation... Broach feet  
Production... 130 per hour  
Equipment... CINCINNATI No. 5-54 Single Ram Vertical Hydro-Broach Machine, tooled up with broach inserts (cutters) and a fixture having interchangeable locating elements

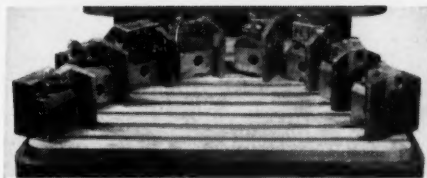


## EIGHT IN THIS FAMILY

Part name..... Terminal studs (8 sizes and shapes)  
Material ..... Copper  
Operation..... Straddle broach sides  
Production..... 125 per hour  
Equipment..... CINCINNATI No. 5-54 Single Ram Vertical Hydro-Broach Machine, tooled up with broach inserts (cutters), fixture and interchangeable fixture elements



# NATI



MACHINES • FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

# PRODUCTION MARKING

at SPEEDS that cut  
today's high operating costs

Whatever you make Noblewest can mark permanently—faster—better—at lower cost. Typical is Noblewest Model 275 vertical dial Rapid Precision Marking Machine. Shown tooled for marking and grooving telephone wire splicing tubes, it does these two jobs in one operation at the rate of 125 pieces per minute. Simple gravity feed and unloading are both automatic and foolproof. The inscription is permanently rolled in—lasts as long as the product itself.

Whatever your needs for marking, Noblewest makes the machines, dies, and fixtures that do the job faster, better and at lower cost. Write Noble & Westbrook Mfg. Co., 25 Westbrook St., East Hartford 8, Conn.



Send for copy of our latest catalog "Modern Metal Marking Methods," or better still, send us complete details of your specific requirements.

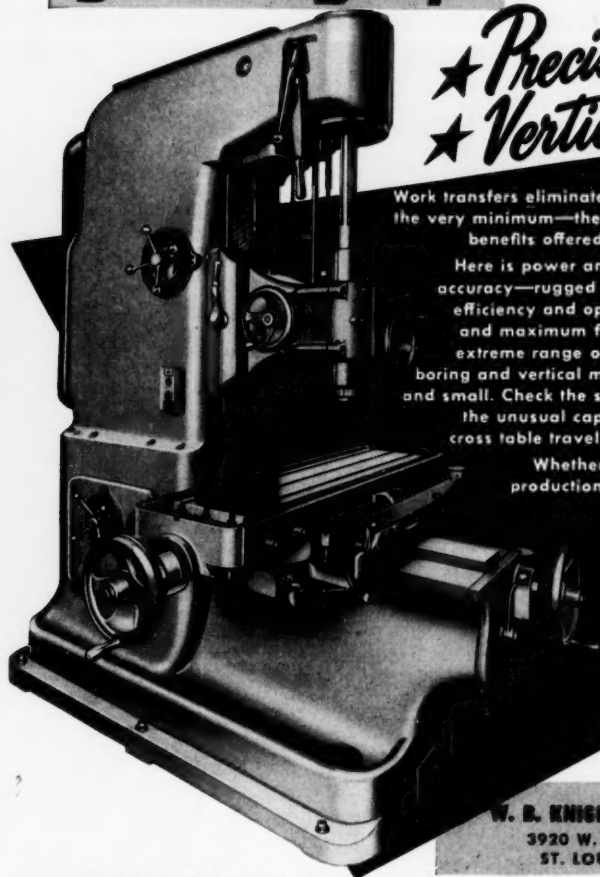


EQUIPMENT FOR MARKING • GRADUATING • EMBOSSING • NUMBERING

# Double Duty!

**KNIGHT'S NO. 50  
DOES BOTH . . .**

★ *Precision Boring*  
★ *Vertical Milling*



Work transfers eliminated—setup time held to the very minimum—these are but two of the benefits offered in the Knight No. 50!

Here is power and speed—exceptional accuracy—rugged strength and rigidity—efficiency and operating convenience—and maximum flexibility to handle an extreme range of difficult and unusual boring and vertical milling jobs, both large and small. Check the specifications and note the unusual capacity provided by the cross table travel and verticle capacity.

Whether used in tool room or production line, Knight's No. 50 promises sizable cost reductions and increased output. Get the facts . . .

*Mail the  
Coupon  
Today!*

## SPECIFICATIONS

- Table travel—Longitudinal 28"; cross 18"
- Vertical capacity—28"
- Table feeds—Dial type, 16
- Table feeds—per minute, 5/16" to 20"
- Table rapid traverse—both directions 100"
- Spindle speeds, 16—40 to 2000 R.P.M.
- Boring feeds—Infinitely variable, .0000"—.010"
- Horsepower, 7½      ● Weight, 8100 Lbs.

**W. B. KNIGHT MACHINERY CO.**

3922 W. PINE BLVD.  
ST. LOUIS 8, MO.



ATTACH TO COMPANY LETTERHEAD

**W. B. KNIGHT MACHINERY CO.**  
3922 W. PINE BLVD.      ST. LOUIS 8, MO.

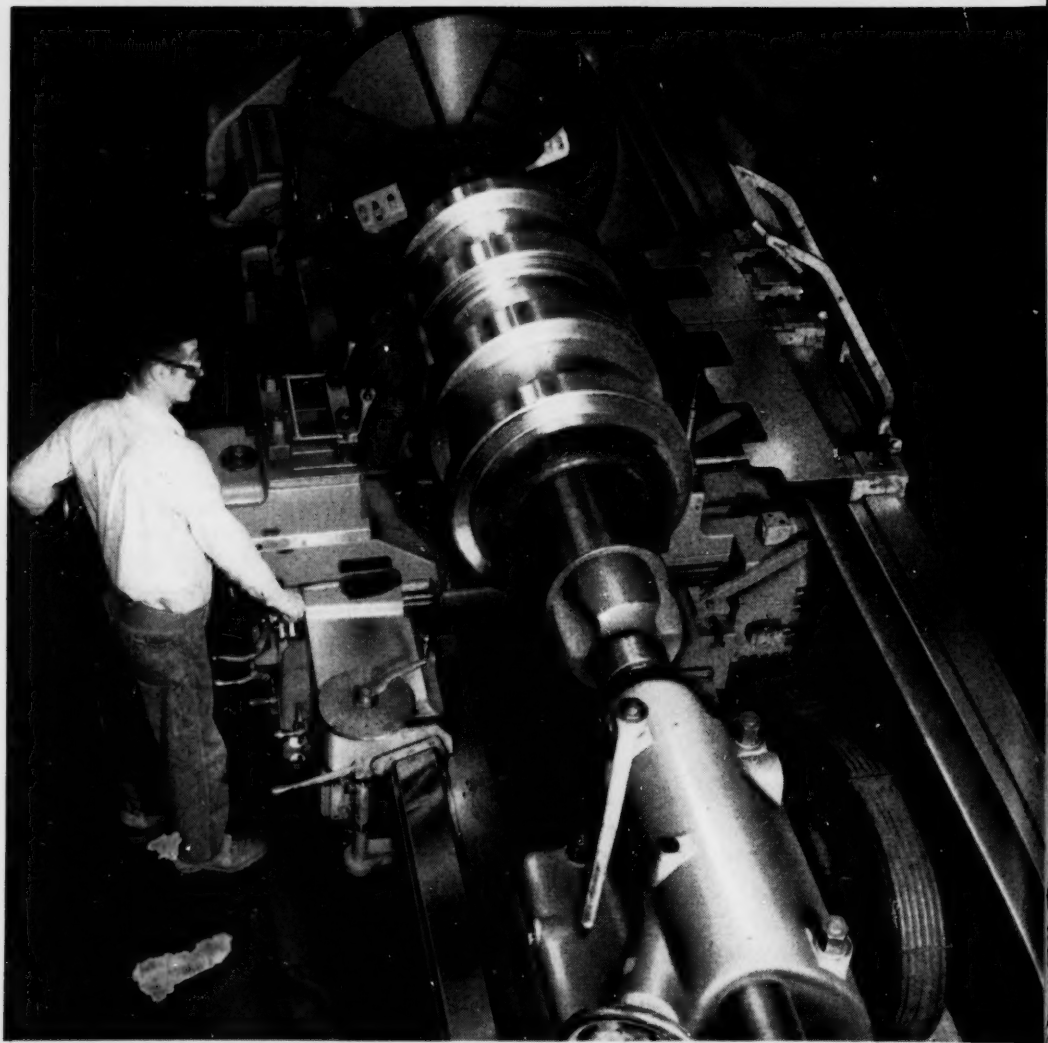
Please send catalog on No. 50 and other Knight Milling machines.

Name .....

Title .....

☐ Send information on Knight's 20" and 42" Rotary Tables

# LeBlond Lathe eases cost squeeze ...on rolls that



A set of Shape rolls of 30½" dia. x 51" body cast alloy semi-steel are turned to .005" tolerance in 94 hours on this 50" LeBlond Roll Contouring Lathe. Set-up time ¼ hour. Clamped on and brazed-on carbide tips are used at 48 rpm, .040 ipr feed. Conventional roll lathe took 745 hours for the same set of rolls.



# squeeze channels from blooms

U. S. Steel

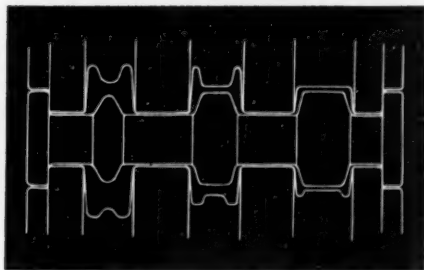
*Lops 151 Hours Off*

*245-Hour Roll-Turning Job.*

Every day at U. S. Steel's Clairton Works, Clairton, Pa., miles of "hotter-than-orange" steel are squeezed through the passes of rolls like these for reduction, elongation, shaping. They come out as finished structural steel for the "jungle-gym" frameworks of modern buildings. Turning these costly shape rolls with their steep-angle contours used to keep a lathe running 245 hours on a set of roughing rolls at U. S. Steel. Tool life was short and the job required highly skilled operators. Stepped-up schedules called for a new solution to this tough-nut production problem.

A LeBlond 50" Roll Contouring Lathe, as recommended by Pittsburgh Distributor, Barney Machinery Co., immediately slashed the 245-hour turning time by an astonishing 61.7%. Now U. S. Steel saves 151 hours on one set of roughing rolls—more than enough time to turn out two more just like it. Tool life is greatly improved and less experienced operators can handle the work.

The 50" LeBlond Roll Contouring Lathe is equipped with two-directional hydraulic tracing. A single valve automatically controls two hydraulic motors for cross and length feed. A stylus follows a flat template mounted at the back of the lathe. Feed and speed can be varied during a cut without leaving a tool mark. For roughing,



*Typical roughing rolls for 8" channel*

hydraulic cross feed can be by-passed and length feed used separately. This enables operator to cross feed manually, use template as length stop. Mechanical power rapid traverse to carriage and cross slide is also provided. All controls are located conveniently at the apron. The lathe uses a 40 constant horsepower DC motor, has nine speed changes in the headstock, delivers infinitely variable speeds from 1 to 165 rpm.

Whether your turning jobs involve specialized production like roll-turning, or call for high precision, high production—investigate LeBlond's complete line of 76 lathe models. LeBlond engineers will help you get a better turning job, faster. Write today or see your nearby LeBlond Distributor.

*Ask for complete information  
on Roll Contouring Lathes in  
25", 32", 40" and 50" sizes.*

**Turned faster by**



**THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO**

**WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 66 YEARS**

# You're HOOKED



## but GOOD with a JARVIS TAP

We mean, of course, the "custom made" controlled hook ground in the flutes of a Jarvis Tap. Our highly accurate machine fluting process, in which wheel radius, depth of grind and indexing are painstakingly controlled, is a guarantee that the amount of hook ground for your particular needs will be precisely met!

*Jarvis*  
**POWER TOOLS**

### TAPPING ATTACHMENTS

• TAPS • FLEXIBLE SHAFTS

AND MACHINES • ROTARY FILES

• TUNGSTEN CARBIDE REAMERS AND

MILLS • DRILLS • BORING BITS

For a "CUSTOM MADE" Tap at no  
extra charge, for the finest Taps made  
— see your JARVIS representative.

Send for  
complete  
catalog.

**THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT**

For  
Multiple  
Tapping  
and  
Drilling ...

# Jarvis

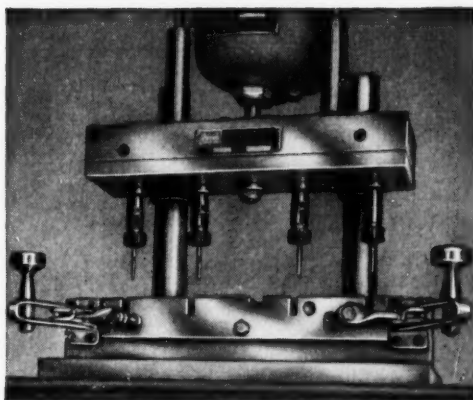
## MULTI-TAPPERS

Engineered and built to your specific production requirements from our basic standard components, Jarvis Multi-Tappers can be furnished for any type of drill press available.

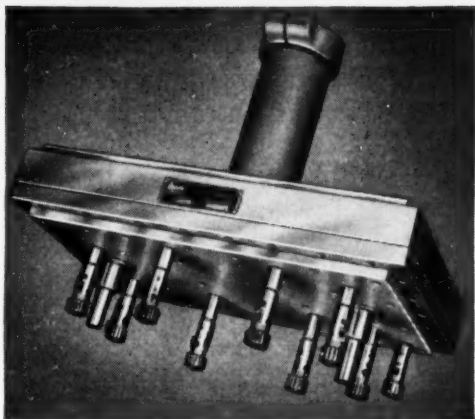
We invite your inquiries—let us assist in analyzing your tapping and drilling needs!



Send for our catalog  
featuring  
Jarvis Multi-tappers



AN INDUSTRIAL MACHINE FOR INDUSTRIAL USERS



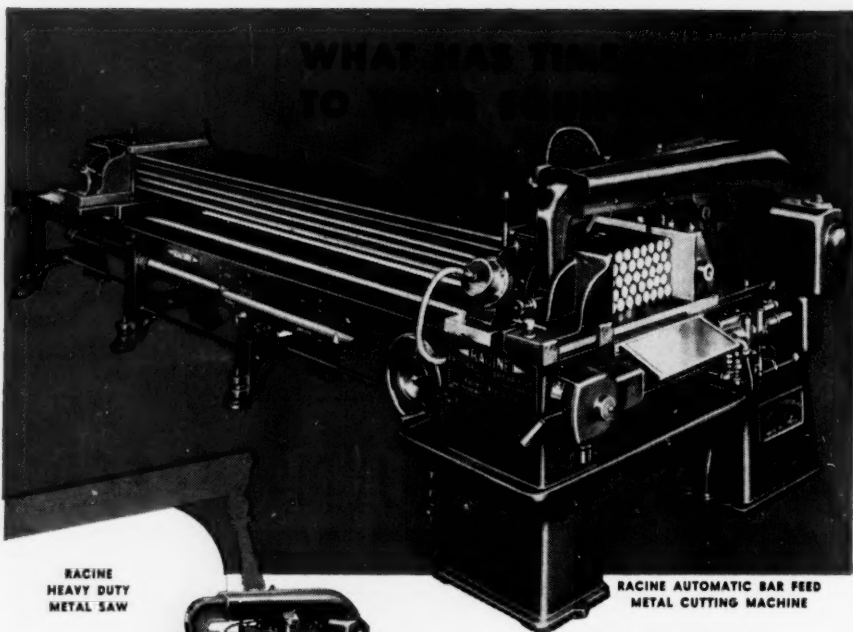
### NEW FEATURES OF JARVIS MULTI-TAPPERS

include:

- Aluminum case—Jig bored.
- Gear driven—positive action, silent drive.
- Ball bearings throughout.

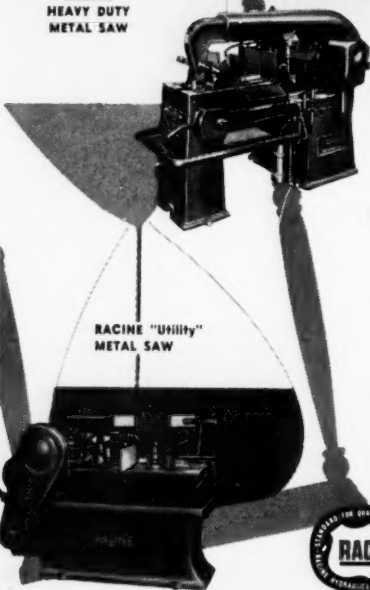
WHEN POWERED WITH A JARVIS TORQOMATIC DRIVE THE JARVIS MULTI-TAPPER PROVIDES THE MOST EFFICIENT AND PRODUCTIVE MACHINE IN THE FIELD.

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT



**RACINE  
HEAVY DUTY  
METAL SAW**

**RACINE AUTOMATIC BAR FEED  
METAL CUTTING MACHINE**



**RACINE "Utility"  
METAL SAW**

Obsolete equipment can increase your production costs to such an extent it is difficult for you to be competitive with your products.

Take your metal cutting operation, for example. How much stock do you waste because of inaccuracy?

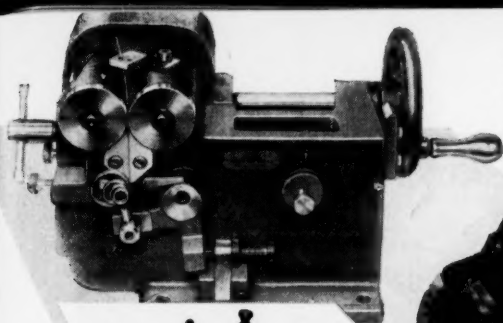
What about subsequent excessive machinery to say nothing of short blade life and less cuts per hour. All of these build up costs that soon offset the price of a new power saw.

Investigate Racine's complete line of Hydraulically Operated and Hydraulically Controlled Metal Cutting Machines. Capacities 6" x 6" to 20" x 20" High speed — accurate and economical.

Write for descriptive Catalog and free production estimate sheets. Simply describe your work and needs. Address **RACINE HYDRAULICS & MACHINERY, INC.**, 2070 Albert St., Racine, Wisc.



**RACINE**  
**HYDRAULICS & MACHINERY, Inc.**  
**RACINE, WISCONSIN**



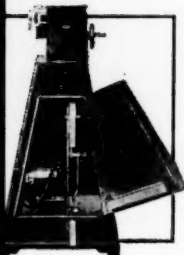
Hand-operated model for tool-rooms, maintenance work or research labs. Approved and used by the Armed Services.



Only 7" high (lowest in the trade), **Omni-vise #4**, shown here, is tough, weighs 74 lbs. Jaws are 4" x 1½", open to 4". Base is 9" in diameter one side straight.

## new slant on shop profits!

When you need a replacement or experimental spring, any shape, diameter or pitch from flat or round wire sizes .005" to .125", you can produce it in a matter of seconds with the new Perkins Precision Spring Coiler! You entirely eliminate the use of arbors, yet turn out precision springs — torsion, compression, extension tapered, or special springs — coiled either left or right hand, in any desired length, any diameter from 1/16" to 12" and larger, with or without initial tension, and with open or closed ends. Eliminate expensive special orders and costly production delays! Make your own springs to exact specifications for replacements or experimental work. Make them fast right in your own shop!



Power model for continuous runs, on welded steel console base.

**EXCLUSIVE DISTRIBUTORS OF  
PERKINS MACHINE  
TOOLS**

**Connors and Davis  
Sales Corporation**



Accurately set in all three planes in only 15 seconds, this sturdy precision vise made in two capacities saves time and headaches for progressive shop operators and pays for itself quickly. Only 7" high (lowest in the trade), **OMNI-VISE #4**, shown at top, is tough, weighs 74 lbs. Jaws are 4" x 1½", open to 4". Base is 9" in diameter with one side straight. Inset shows **OMNI-VISE #2**, a precision low-priced vise. Users find it exceptional for grinding compound angles on carbide tools. Weight, 16 lbs. Height, 4¾". Jaws, 2⅞". Opening, 2⅞". Base, 7¼" x 5". For grinding, drilling or general work at any angle, by hand or machine, an **OMNI-VISE** is the machinist's choice.

**CONNORS AND DAVIS Sales Corporation**  
401 Circuit Avenue, West Springfield, Mass.

Please send detailed information and prices on:

**PERKINS SPRING COILER**

hand ☐ power ☐

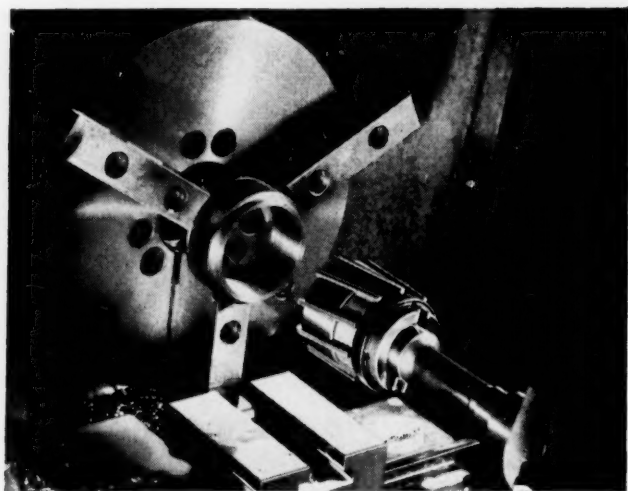
**OMNI-VISE #4** ☐ **#2** ☐

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

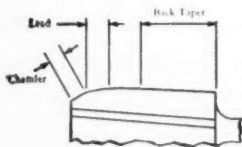


## **REAMER DESIGN Controls** **Accuracy, Finish and Production**

Barber-Colman Reamers produce finishes which were not previously considered possible on a standard production operation. Exceptional accuracy and tool life are also obtained on production runs as a result of the special features of Barber-Colman Reamers. Both solid-fluted and inserted-blade reamers are available.



Irregular flute spacing provides a smooth cutting action and fine finish, and helps to prevent the reamer from forming "welts". As a standard feature on all Barber-Colman Reamers, flutes or blades are spaced diametrically opposite each other so that they are easily checked with a micrometer.



The profile form on Barber-Colman Reamers is designed to produce the best possible finish and tool life. Following the chamfer, the lead is blended into a radius to produce exceptionally fine finishes. Through Barber-Colman cam-controlled sharpening, a sharp cutting edge, rather than a cylindrical land, is produced, resulting in a freer cutting action. With this control, successive reamers are sharpened with exactly the same profile form and relief angles to provide exact duplication of size, straightness and roundness.

**DESIGNERS OF STANDARD AND SPECIAL**



### 20-25 micro-inch finish typical

On this job, 1000 pieces are reamed to a surface finish of 20-25 micro-inches before it is necessary to re-sharpen the reamer. The feed is 1.75" per minute at 280 rpm., requiring 30 seconds to ream the  $\frac{7}{8}$ " length of cut. Material is AISI C1137 steel.

### 1500 pieces per sharpening

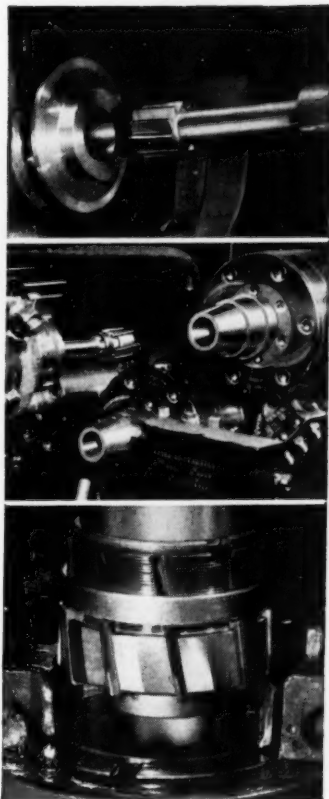
This carbide-tipped inserted-blade reamer produces from 1100 to 1500 pieces per sharpening while maintaining the finish better than 60 rms. Tolerance on hole size is .002". Stock removal is .012" to .015" on the diameter, and the material is B1117 steel. Speed is 105 sfm, and the feed is .0188" per revolution. A Barber-Colman Reamer Sharpener reproduces the correct profile on the reamer blades with each sharpening.

### tool cost reduced from \$1.57 to \$1.32

These Barber-Colman Reamers are producing truck cylinder liners with accurate straight round holes free from welts or taper at a tool cost 15% less than previous records. Material is cast iron. Replaceable blades with carbide tips give long reamer life and cutting edges which stand up under continuous production. 675 more pieces per set of blades are now obtained, and tool cost per 100 liners has been reduced from \$1.57 to \$1.32.

If you are now choosing between accurate, quality-finish reamed holes — and low-cost production and tool maintenance — you can have both, using Barber-Colman Reamers. More flutes per cutting diameter, solidly backed cutting edges, and standard irregular flute spacing will give you tool room reaming quality under regular production conditions.

Send specifications on hole sizing and finishing problems to Barber-Colman engineers. They will furnish reamers for your particular requirements to give you the desired quality consistently.



HOBBS • CUTTERS • REAMERS  
HOBBLING MACHINES  
HOB SHARPENING MACHINES



**Barber-Colman Company**

GENERAL OFFICES AND PLANT, 951 ROCK STREET, ROCKFORD, ILLINOIS

M E T A L   C U T T I N G   T O O L S   S I N C E   1 9 0 8

# eliminate the guesswork in selecting tool steels

Thousands of metal working people are using the Crucible Tool Steel Selector to determine exactly which type of steel they need. This handy selector covers 22 tool steels which fit 98% of all tool steel applications.



## HERE'S AN EXAMPLE:

Application — Deep drawing die for steel

Major Class — Metal Forming — Cold

Sub-Group — Special Purpose

Tool Characteristics — Wear Resistance

Tool Steel — Airdi 150

A turn of the dial does it! And you're sure you're right

The selector is unique because it starts with the ultimate use of the steel. It breaks down all tool steel applications into six major classifications, under which the different grades of steel available for certain specific requirements are indicated in legible cutouts. Heat treatment and machinability data are also included for each grade.

A flip of the dial will give you the answer, and almost just as quickly you can get the steel you select. For each type of steel shown on the selector is in stock in Crucible warehouses, conveniently located throughout the country.

To get your Selector merely fill in the coupon and mail. There is no obligation whatsoever.



1/3 actual size, Selector is in 3 colors

Crucible Steel Company of America  
Dept. MS, Oliver Building,  
Pittsburgh, Pa.

Name \_\_\_\_\_

Company \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

**CRUCIBLE**

54 years of *Fine* steelmaking

first name in special purpose steels

**TOOL STEELS**

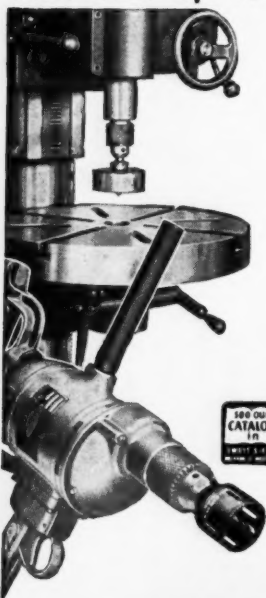
CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N. Y.

# Cut... LARGE HOLES

... thru any machineable  
material up to 1 1/8 INCHES thick!



Here is a premium tool which makes it possible to saw holes in one short operation ... large holes which heretofore had to be laboriously machined "a-chip-at-a-time."



MARVEL High-Speed-Edge Hole Saws have strength to withstand the terrific peripheral strains of heavy duty operation in lathes, drill presses or portable power tools. They have a high speed steel cutting edge which is electrically welded to a tough, alloy steel body, high speed steel pilot drills, heavy hexagonal shanked arbors and sufficient set for deep drilling. They are self-aligning, as the larger diameter saws float on their arbors and are driven by double drive pins. They will saw round holes accurately in any machineable material.

MARVEL High Speed-Edge Hole Saws come in 35 sizes, from 3/8" to 4 1/2". They are carried in stock by leading industrial distributors

WRITE FOR BULLETIN ST-650

"MARVEL" has *Always* had the edge!

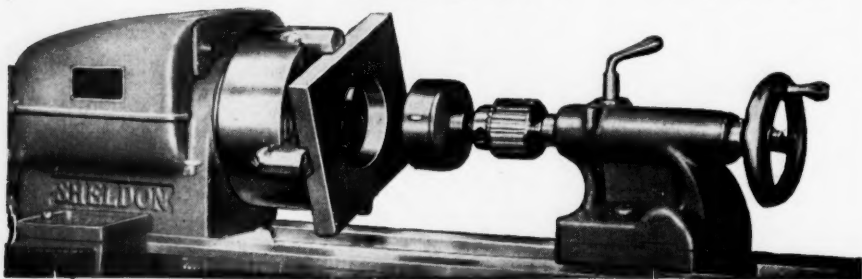


ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

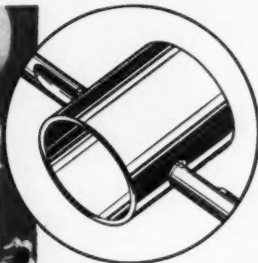
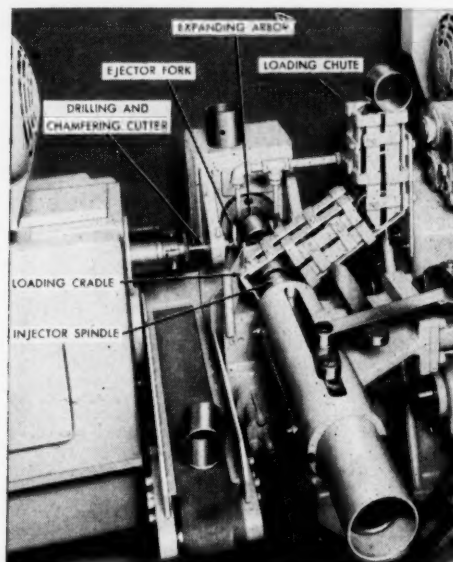
5700 Bloomingdale Avenue

Chicago 39, U. S. A.



# MACHINE OF THE MONTH

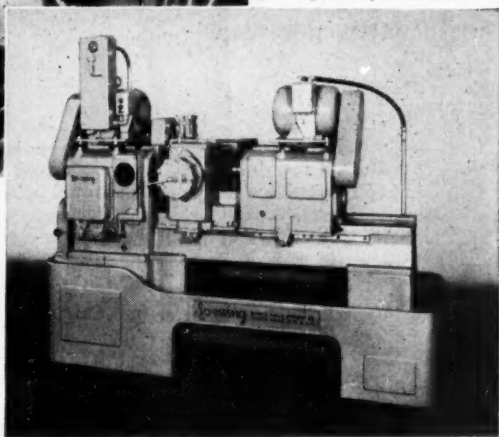
PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



▲ Schematic diagram showing application of two combination Drilling and Chamfering Cutters to work.

◀ Closeup rear view of machine with safety cover removed to show automatic loading mechanism.

▼ Overall front view of machine.



## MODEL "CS" AUTOMATIC DRILLING MACHINE DRILLS SMALL MOTOR FRAMES AT FAST PACE

**Problem:** To automatically load, drill and chamfer two holes at 180° and automatically eject small motor frames.

**Solution:** The Model "CS" Automatic Drilling Machine selected for this job was equipped with two Drilling Heads and a combination holding, loading and ejection mechanism shown in upper illustration.

In operation, the frames, which have been faced to length in a previous operation, are placed in the loading chute and fed by gravity to the loading cradle where they are picked up by the injector spindle and placed on an air-operated expanding arbor. The injector then retracts to clear the work and the two combination drilling and chamfering cutters advance in rapid traverse to the work piece; then slow down for the length of cutting stroke and finally return in rapid traverse to the starting position. The finished piece is automatically ejected by the ejector

fork and falls on a moving conveyor which carries it to a tote box, and at the same time keeps the machine clear of chips.

The entire operation is automatic and controlled by cams mounted on a camshaft which synchronizes all machine and loader movements. The loading and unloading takes place during a short dwell milled in the drilling head cams. The operator simply loads the parts in the loading chute, the machine takes over from this point. Production is 600 pieces per hour at 100% efficiency.

Consult Lo-swing engineers about your machining problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swing

**TODAY'S BEST BUY!**



## **JOHNSON Model B**

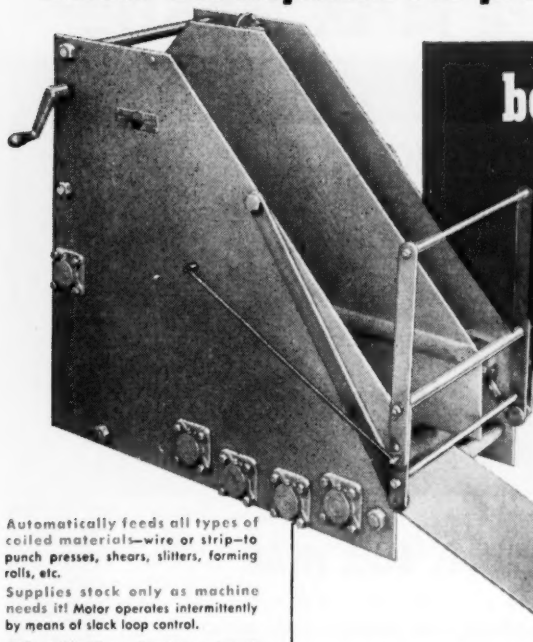
A full 5" x 10" capacity, low cost, handy saw for use in both small and large plants. Get details. Write today.

THERE IS A JOHNSON DEALER NEAR YOU

**JOHNSON MANUFACTURING CORP.**  
ALBION, MICHIGAN



**Latest development for production shops...**



## benchmaster *Koil Kradle*

**Automatically feeds  
coil stock as required  
without adjustment or  
operator attention!**

Automatically feeds all types of coiled materials—wire or strip—to punch presses, shears, slitters, forming rolls, etc.

Supplies stock only as machine needs it! Motor operates intermittently by means of slack loop control.

Adjustable Timer—Provides a shut-off delay after motor switch is tripped. A slack loop of predetermined length is then formed from which forming machine can draw.

Adjustable width control—Reel space is quickly adjusted to accommodate varying roll sizes by rotating a crank. Steel guide plate is moved laterally by three lead screws, simultaneously driven by roller chain.

Reversible motor—Operates in either direction for feeding or rewinding stock. Reversing switch is supplied as standard equipment.

Easy loading—Slack loop actuating bar lifts up, exposing entire reel area. Coils are rolled up ramp, eliminating all lifting.

4 power driven rolls, linked by roller chain insure positive reel drive. Rolls are heat-treated for maximum life.

Anti-friction pillow blocks—Power rolls and back-stop roll are mounted in cast iron pillow blocks, each equipped with roller type needle bearings for long life and trouble-free operation. Alemite fittings permit easy lubrication.

See your dealer or contact  
Benchmaster Manufacturing  
Company 1835 West Rosecrans  
Avenue, Gardena, Calif.

The Benchmaster Koil Kradle is designed to fulfill a wide variety of feeding problems. It automatically supplies a slack loop of material feeding any machine from the slack loop rather than from the weight of the coil. Material fed over the actuating bar triggers a micro-switch as the slack loop tightens. The power rolls then rotate the coil, forming a new slack loop; correct loop size is uniformly maintained for any machine requirement, with no attention from the operator! Standard coil speed, continuous operation, 90 feet per minute.

### THREE SIZES

Model	Load Capacity	Roll Width	Roll Diameter	Motor h.p. & phase*	Approx. Shipping Wt.
310	1200 lbs.	10"	36"	1/4 h.p. single phase	302 lbs.
313	1200 lbs.	13"	36"	110 V ac ball bearing, capacitor type. (3 phase available)	310 lbs.
315	1200 lbs.	15"	36"		328 lbs.

\*All motors reversible, reversing switch supplied as standard equipment.

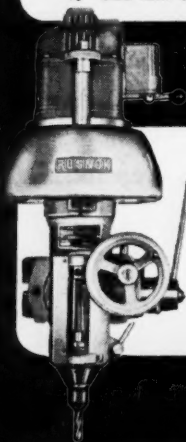
**benchmaster**

World's largest  
manufacturer of small punch  
presses and mills.

# **RUSNOK** MILL HEADS

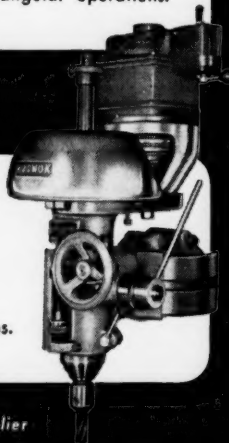
## **1/4 H. P. CONVERTICAL MILL HEAD**

Only low cost mill head with quill travel attachment.  
High speed medium-light operation.  
For bench, floor and pedestal mills.  
Fits milling machines with overarm 1 1/2" to 3".  
3/8" end mill capacity.



## **1/2 H. P. MILL HEAD**

HEAVY DUTY MILLING ATTACHMENT  
Fits milling machines with 3" to 5" overarm.  
3/4" end mill capacity.  
For vertical, horizontal and angular operations.



## **1 H. P. MILL HEAD**

HEAVY DUTY MILLING ATTACHMENT  
Fits milling machines with 3" to 5" overarm.  
3/4" end mill capacity.  
For vertical, horizontal and angular operations.

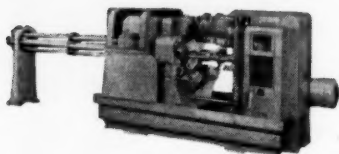
WRITE for complete details and give name of your supplier

# **RUSNOK**

**RUSNOK TOOL WORKS, 4840 W. North Ave., Chicago 39, Ill.  
MILLING • DRILLING • BORING**

# NO CAM WORRIES

with Warner & Swasey Multi-Spindle Automatics



Automatic Bar Machines

1 $\frac{3}{4}$ " Standard Capacity

2 $\frac{1}{4}$ " Oversize Capacity

and now, newly introduced

$\frac{3}{4}$ " Bar Capacity

1 $\frac{1}{4}$ " Bar Capacity

Automatic Chucking Machine 6" Swing

**J**UST MAKE a simple setting on a Warner & Swasey—and there you have your new feed stroke, clearly indicated on a graduated scale. Yes, it's as easy as that! All feed strokes are quickly available for both longitudinal and cross slides. No more need to sacrifice cycle time because the "right" cam is not on hand or because a cam change would take too long. You always get your exact feed stroke quickly on Warner & Swasey Multi-Spindle Automatics.



NO CAMS TO DESIGN



NO CAMS TO MACHINE



NO CAMS TO STORE



NO CAMS TO FIND



NO CAMS TO CHANGE

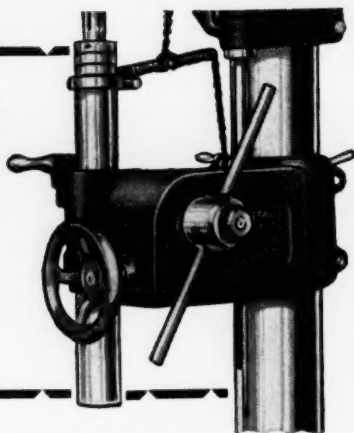


IT'S SIMPLE TO SET UP!



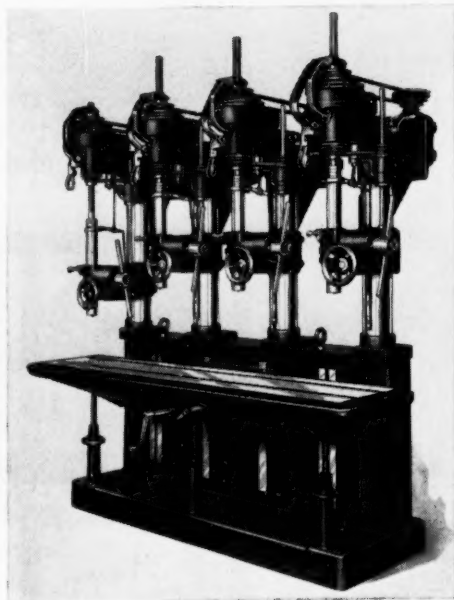
YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

# HIGH DRILLING OUTPUT STARTS AT THE FEED CONTROL



## BIG "BUFFALO" NO. 22 DRILL HANDLES AS EASILY AS SMALL SENSITIVE DRILLS!

Eight feet high . . .  $1\frac{1}{4}$  capacity in mild steel . . . yet this big drilling machine handles almost without effort. That's because "Buffalo" designs all controls and adjustment cranks from the operator's viewpoint . . . easy and quick to reach in natural, relaxed position. This means less waste motion, fewer rejects, higher output during the production day. Available with power feed (shown at top) or sensitive feed, pedestal or round column, one to six spindles. And from spindle tip to base, these are quality drills built for many, many years "on the line." It may well be that a "22" is the answer to your profit problem. Why not write for Bulletin 2989-F, and see?



4-Spindle unit to handle 4 drilling and tapping operations at once or in sequence.

**"Buffalo"**

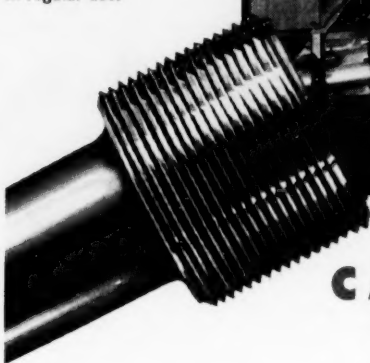
## BUFFALO FORGE COMPANY

388 Broadway  
Buffalo, N. Y.  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.  
Sales Representatives in all Principal Cities

DRILLING • PUNCHING • SHEARING • CUTTING • BENDING

## Greater Inspection Economies Are Yours

A section of the Lincoln Park thread grinding department showing a portion of the modern equipment in regular use.



### WITH LINCOLN PARK CARBIDE OR STEEL THREAD GAGES

● The manufacture of plug thread gages has been a Lincoln Park specialty for many years. In fact, this company was the first to successfully produce carbide thread gages. It is this experience that assures you of gages of unquestioned accuracy and maximum service life.

Today, Lincoln Park carbide thread plug gages are supplied in a standard size range from a No. 4 machine screw size to 3" diameter . . . in steel from No. 0 to 6" diameter. Almost any specifications for tolerance, lead or pitch can be met. Many sizes can be delivered immediately from stock and prompt delivery can always be expected on all others.

Our new catalog lists and prices thread gages as well as all other products manufactured by Lincoln Park. Your copy will be sent you if requested on your company letterhead.

Lincoln Park offers the facilities for many of your precision production thread grinding needs. We invite your inquiries.

*Lincoln Park*

1719 FERRIS AVENUE

THE PLUS IN PRECISION

INDUSTRIES, INC.

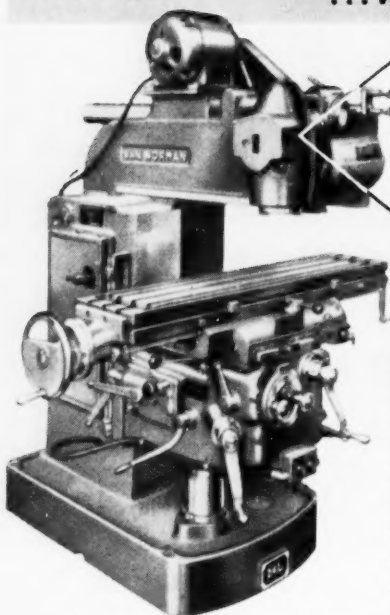
• LINCOLN PARK 25, MICHIGAN

DESIGNERS AND MANUFACTURERS OF: SPECIAL AND STANDARD CARBIDE CHROME PLATED AND STEEL GAGES  
CARBIDE ROTARY FILES • ALSO FACILITIES AND SKILLED PERSONNEL AVAILABLE FOR PRECISION PARTS PRODUCTION



# New 10 MODELS VAN NORMAN Ram Type Milling Machines

Providing Maximum "Flex-Ability" and "Cut-Ability"  
... Will Reduce Milling Costs!



No. 24L shown is 1 of 10 new models



Adjustable cutterhead permits horizontal, vertical as well as angular milling on one machine.

## Van Norman Plus Features

"Flex-Ability" is increased with the *new*, improved heavy-duty adjustable cutterhead which has 90° adjustment ... permits horizontal, vertical as well as angular milling.

"Cut-Ability" is increased with the *new* box type column, with its heavier and wider cross sections whose internal ribbing provides utmost rigidity. This generous ribbing provides maximum strength, assuring rigid support for the extra long ram, as well as the heavy knee.

"Cut-Ability" is increased with the *new* heavy motorized knee. The direct drive feed motor is mounted on the knee. The 10 models provide a selection of horsepower from 3 to 10.

"Flex-Ability" is increased with the *new* extended, large, heavy-duty ram, which increases the capacity of the miller ... permitting maximum cuts over the entire ram range to the full capacity of the motor.

"Cut-Ability" is increased with the *new* heavy knee, saddle and table assembly ... designed as a unit to provide maximum rigidity and accuracy.

"Flex-Ability" is increased by the spindle motor that drives cutterhead only ... permits every type of milling with all types of cutting tools.

Write for more information about these new Van Norman Ram Type Milling Machines.

## Maximum "FLEX-ABILITY" with the VAN NORMAN Adjustable Cutterhead



A typical horizontal milling operation performed on the new Van Norman Ram-type Miller.



An angular milling operation performed on the same work piece. Note work piece remains in the same set-up. Angular range of cutterhead 0°-90°.



With the cutterhead locked in vertical position a slot is milled in the work piece. Note the set-up has not been changed.

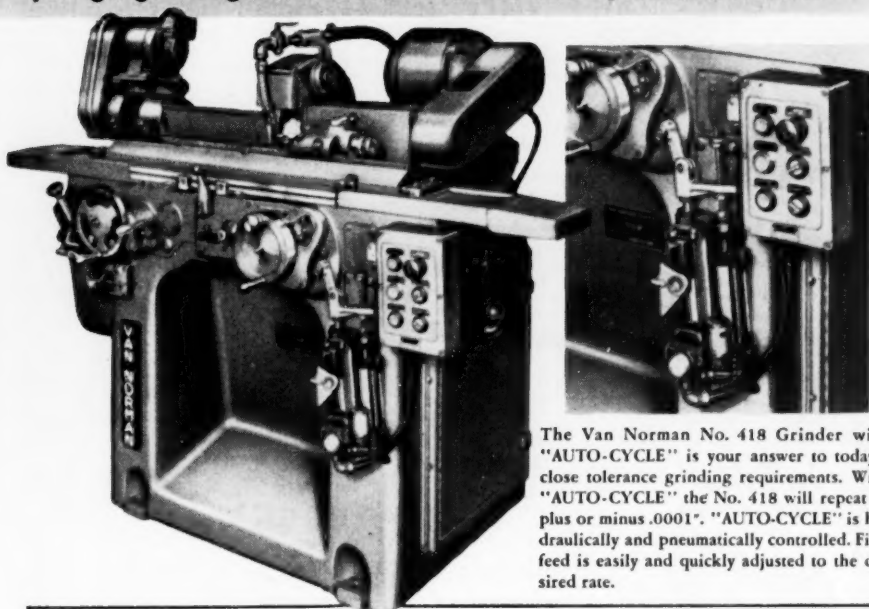
**VAN NORMAN** — manufacturers of — Ram and Column Type Milling Machines, Cylindrical Grinders, Spline Grinders, Oscillating Radius Grinders, Special Production Grinders, Centrifugal Grinders.



*New*

## "AUTO-CYCLE" INFEED ATTACHMENT

*provides Completely Automatic cycle for  
plunge grinding on Van Norman No. 418 Cylindrical Grinders*



The Van Norman No. 418 Grinder with "AUTO-CYCLE" is your answer to today's close tolerance grinding requirements. With "AUTO-CYCLE" the No. 418 will repeat to plus or minus .0001". "AUTO-CYCLE" is hydraulically and pneumatically controlled. Fine feed is easily and quickly adjusted to the desired rate.

### **Plus Features on the No. 418 Grinder**

- Wheel spindle is of unit type construction — totally enclosed with double row precision cylindrical roller bearings, proved on thousands of Van Norman Grinders, assuring maximum accuracy and long operating life.
- Heavy-duty headstock and footstock for rigidity, accuracy and smooth grinding.
- Automatic starting and stopping of headstock and table traverse.
- Rugged base, with wide table bearing ways.

Separate motor drives for wheel spindle, table and headstock.

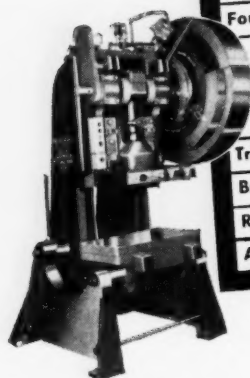
- Controls are conveniently grouped in front of grinder for ease of operation.
- One-shot metered lubrication for all bearing surfaces on ways.
- Capacity 4" x 18". Can be purchased with or without "AUTO-CYCLE".

Write for complete information. Ask for prices. They're remarkably low for such high quality equipment.

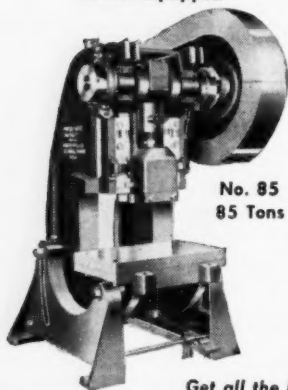


**VAN NORMAN COMPANY, Springfield 7, Massachusetts**

# How does YOUR PRESS check out?



No. 60  
60 Tons—Air  
Clutch Equipped



No. 85  
85 Tons

STANDARD PRESS FEATURES (at no extra cost!)	PRESS- RITE	YOUR PRESS
Uni-Cast Frame	✓	
Anti-Friction Roller Bearings in Flywheel	✓	
Four Point Engagement Sliding Clutch Key	✓	
Automatic Cam Operated Brake	✓	
Cam Operated Single Stroke Safety Mechanism	✓	
Built-In Tie Rods	✓	
Triple Ramway Lubrication	✓	
Bronze Bushed Main Bearings	✓	
Replaceable Die Shank Bushing	✓	
Airflex Friction Clutch (optional at extra cost)	✓	

## PRESS-RITE POWER PRESSES

**Now** You Get All These Features in **One** Press . . . the Press-Rite Press. Buy Press-Rite Presses today and get increased production . . . longer die life . . . greater operator confidence . . . longer press life . . . and scores of other benefits. Press-Rite Presses help to cut your operating expenses and eliminate costly down time. Find out more about Press-Rite Presses today.



Get all the Facts. Send for Bulletin P552.

### Sales Service Machine Tool Co.

PRESS RITE PRESSES • SHAPE RITE SHAPEKERS • KELLER POWER HACK SAWS

2355 UNIVERSITY AVENUE • ST. PAUL 4, MINNESOTA



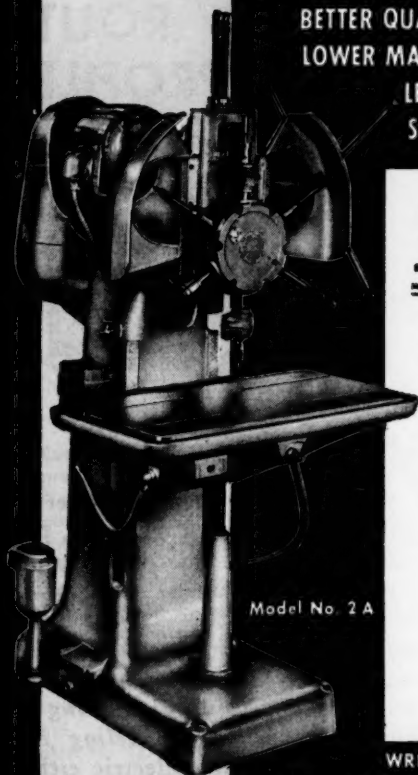
# BURGMASER

**CAN INCREASE  
YOUR PRODUCTION**

**AS MUCH AS 50%...with  
LOWER COST PER PIECE MACHINED**

**BETTER QUALITY OF PARTS  
LOWER MAINTENANCE COST  
LESS FLOOR SPACE  
SIMPLE SET-UP**

*too!*



Model No. 2 A



THE  
AUTOMATIC  
COMPANY  
BIRMINGHAM, ALA.

Manufacturers of Automatic Parts and Service Tools

August 19, 1953

Burg Tool Manufacturing Co.  
3743 Durango Avenue  
Los Angeles 34, California

Attn: J. L. Burg, Vice Pres.

Dear Sirs:

We have your letter of August 12, 1953. The performance of the Burgmaster, Model 2-A, is satisfactory and we have had a minimum of service problems with it. As far as production figures are concerned, we wish to advise that this machine has been converted to semi-automatic operation and consequently it can not be compared to our previous methods. Under the semi-automatic operation setup one operator can run two machines and give us about an 80% increase over the old four or five spindles on one table drill press.

As our production increases, of course we will need additional machines which will be sometime in the future.

We highly recommend this machine for use in both short-run setups and long-run setups, as the setting up and operation is so simple that it does not consume very much time.

If there is any additional information on the Burgmaster line, we would appreciate your sending it to us as we would like to keep up on the latest developments.

Very truly yours,

JES AUTOMATIC CO.

*J. L. Burg*  
J. L. BURG

WLB:hwg/vw

"The Break Parts Set"

**WRITE FOR CATALOG**

**SOME MFG. REP'S TERRITORY STILL AVAILABLE**



**BURG TOOL MFG. CO. DEPT.**

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Used and endorsed by  
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A real money saver.

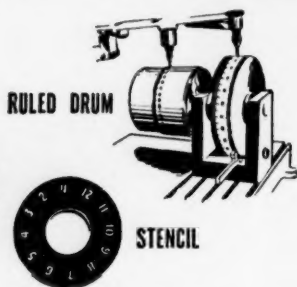
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ROUTS  
PROFILES  
and MODELS**



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FREE: Brochure—  
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engineering service available  
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Specify the Green Engraver for  
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... engraves panels, name plates,  
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tional signs . . . by simple tracing  
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three dimensional modeling indi-  
cate its versatility.* Electric etching  
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**Double-Circle Testing  
assures  
longer life,  
more  
cutting mileage!**

**tool costs  
for you...**

**less shut-down time!**

● Careful testing at Chicago-Latrobe gives accurate appraisal of the number of holes a DOUBLE-CIRCLE Drill will cut before sharpening becomes necessary. Constant effort by Chicago-Latrobe engineers steadily increases performance. High standards of quality and careful inspection of every manufacturing operation is maintained to meet close tolerance specifications... to give you LONGER CUTTING MILEAGE... and less shut-down time.

A variety of types and sizes of DOUBLE-CIRCLE Drills meet every requirement... General Purpose... Heavy Duty... Fast Spiral... Slow Spiral... Bright Spiral... Carbide Tipped and Specials. Write for booklet No. 179 for description.

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DRILLS  
ARE AVAILABLE AT  
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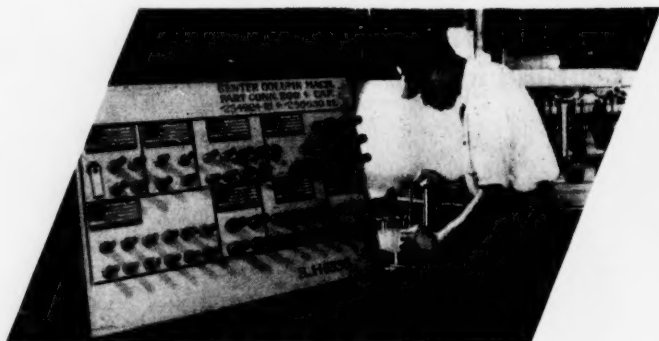
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**DRILLS • REAMERS • COUNTERSINKS • COUNTERBORES • CARBIDE TOOLS • SPECIAL TOOLS**

**SCULLY  
JONES**

# Tool Board and Gages



## **Accurate pre-setting stops reamer and drill breakage... saves 40% setup time for International Harvester**

Here's how International Harvester Company profits from an efficient system for replacing tools on this Footburt 6-station Drill.

First—a special Scully-Jones Tool Board gives operator a complete set of newly sharpened drills and reamers ready to replace broken or worn tools instantly. Each tool is identified as to size, station, tool number and adapter size . . . contributing valuable *human factors* to ease setup problems.

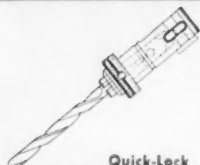
Second—Scully-Jones Height Gages simplify and speed accurate setting of tools. Duplicating holding method of the machine, they eliminate *in-the-machine* adjustments and drilling of samples to check depth. With 56 perishable tools, this fast, foolproof method reduces downtime, increases production by 63 parts per shift.

Third—Scully-Jones Quick-Lock Adapters give precise depth adjustments, accurate fit in spindles, easy insertion and ejection of tools.

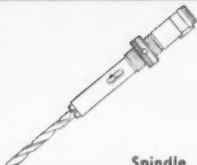
Results—reduced tool breakage . . . setup time cut 40% . . . saving of \$620 per shift per year . . . 63 additional parts every eight-hour shift!

To investigate improved tool and work holding methods, call your Scully-Jones representative or stocking distributor, *today!*

THERE'S A SCULLY-JONES PRECISION TOOL FOR EVERY HOLDING OR DRIVING NEED



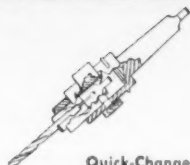
**Quick-Lock**  
Adjustable Adapters  
Permit accurate depth adjustments in cluster of spindles. Speed tool changes.



**Spindle**  
Extension Assemblies  
For driving shank-type tools in multiple-spindle machines.



**Style "JT"**  
Floating Holders  
Reduce scrap and tool breakage on multiple-spindle machines.



**Quick-Change**  
Chucks  
Change tools in "seconds" without stopping spindle. Speed production.



# speed setup, save tool life!

## RESULTS ON THIS JOB:

**Operation** ... drill and ream connecting rods and caps

**Machine** ... 6-station Foot-burt Center Column Drill

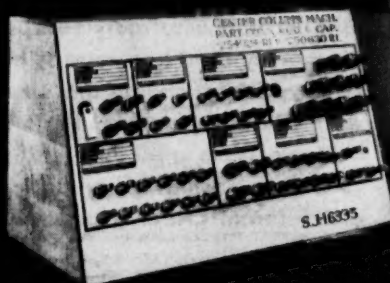
**Scully-Jones Tools** ... Tool Board, Pre-Setting Gages and Adjustable Adapters

**Production Gain** ... 63 parts per shift

**Tool Saving** ... breakage reduced

**Time Saving** ... setup time cut 40%

**Cost Saving** ... \$620 per shift per year



**SCULLY  
JONES**  
*Precision Holding*  
FOR HOLDING PRECISION

Scully-Jones and Company  
1909 South Rockwell Street, Chicago 8, Illinois

**MORE FACTS**—Send for free catalog describing Scully-Jones "Precision Holding" Tools. Paste coupon to letterhead or post card and mail today.

Gentlemen: I'm interested in learning more about Scully-Jones Tools.

☐ Please send Bulletin No. 19-50 describing Pre-Setting Gages.

☐ Send catalog on your complete line.

Name

Company

Address

City  State

# EXCEL No. 6 PAYS BOTH WAYS

**TOOL & CUTTER  
GRINDING  
HEADQUARTERS  
in the smaller shop—**

**EXTRA SHARPENING  
SERVICE  
in the larger plant—**



Builders  
of Precision  
Grinders  
for 79  
Years

An outstanding value in price and performance! The Excel No. 6 Universal Cutter and Tool Grinder will accurately sharpen reamers and milling cutters in a wide variety of shapes and sizes. A full line of attachments is available for a multitude of applications including cylindrical and internal grinding. Base optional.

Swings work.....8" dia. x 16" long  
Face mill capacity.....12" dia.  
Table surface.....4" x 24"

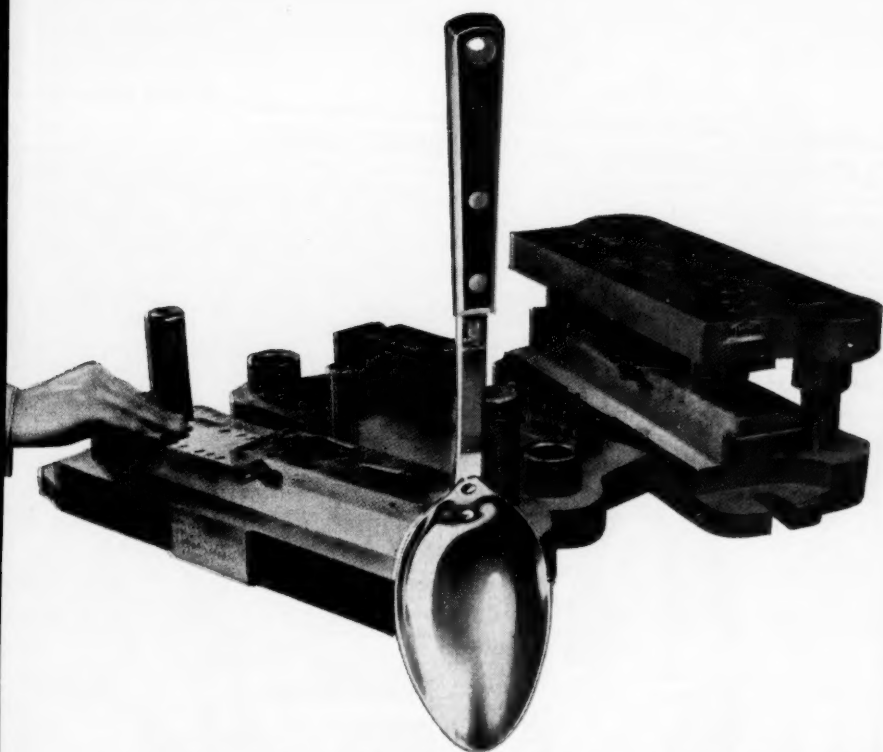
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**PRECISION  
GRINDERS**

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DRILL  
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TOOL GRINDERS  
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E-14



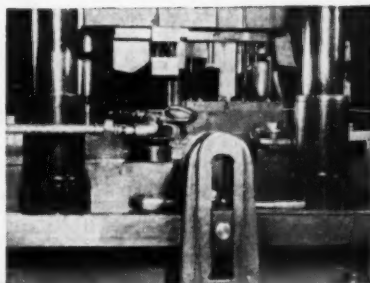
## ***Ekco DEPENDS ON DANLY to save tooling time!***

This popular basting spoon is one of thousands of famous household items made by Ekco Products Company in dies mounted in Danly Die Sets. Ekco depends on Danly Die Sets to save costly tooling time and help maintain uninterrupted production schedules in this highly competitive industry, because Danly Die Sets provide the finest *precision* starting point for diemaking. They are available on short notice from a completely stocked Danly assembly plant nearby.

**Call Your Local Danly Branch Today!**

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 \*CLEVELAND 14\_1550 East 33rd St.  
 \*DAYTON 7\_3196 Delphos Ave.  
 \*DETROIT 16\_1549 Temple Ave.  
 \*GRAND RAPIDS \_113 Michigan St., N.W.  
 INDIANAPOLIS 4\_5 West 10th St.  
 \*LONG ISLAND CITY \_47-28 37th St.  
 \*LOS ANGELES 54\_Ducommun Metals  
 & Supply Co., 4890 South Alameda  
 MILWAUKEE 2\_111 E. Wisconsin Ave.  
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 \*ROCHESTER 6\_33 Rutter St.

\*Indicates complete stock



DIE SETS STANDARD OR SPECIAL  
 DIEMAKERS SUPPLIES

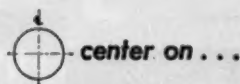
**DANLY MACHINE SPECIALTIES, INC.**  
 2100 South Laramie Avenue  
 Chicago 50, Illinois

## 'LATHEDOG' LEARNS ABOUT CABINET BASES

**LATHEDOG**, STORE THAT STEADY REST, TURRET, TOOL POST AND THEM CHUCKS IN THE CABINET BASES OF YOUR LATHE! SOMEBODY'LL TRIP ON THEM OUT HERE ON THE FLOOR!

CHEE, BOSS, WHERE'LL I PUT MY LUNCH, MAG-AZINES, GYM SHOES, HAT AND COAT IF I USE THEM CABINETS FOR TOOLS?

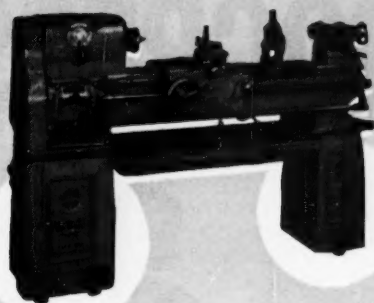
THE BOSS SHOULD'VE COME BY LAST WEEK WHEN **LATHEDOG** WUZ KEEPIN' WHITE MICE IN THEM CABINET BASES!



# cincinnati



Large size prints of this J. R. Williams cartoon are available for framing.



It's amazing the amount of stuff you can store in those handy cabinet bases. But even more amazing is the number of high-priced features you'll find on low-priced Cincinnati Lathes.

1. All geared headstock
2. 12 spindle speeds in geometric progression
3. Direct-reading speed-shifting mechanism
4. Large spindle mounted in three antifriction bearings
5. Flame hardened gears in headstock, quick change box and apron
6. Cabinet legs with built-in leveling jacks
7. Enclosed quick-change box with lead-screw reverse
8. One shot lubrication of ways
9. Ground ways (flame hardened at extra cost)
10. Tray-Tops on headstock and tailstock
11. Double-walled apron with automatic lubrication
12. Fully enclosed electrical panel, built-in disconnect, transformer, motor and controls (all standard equipment)

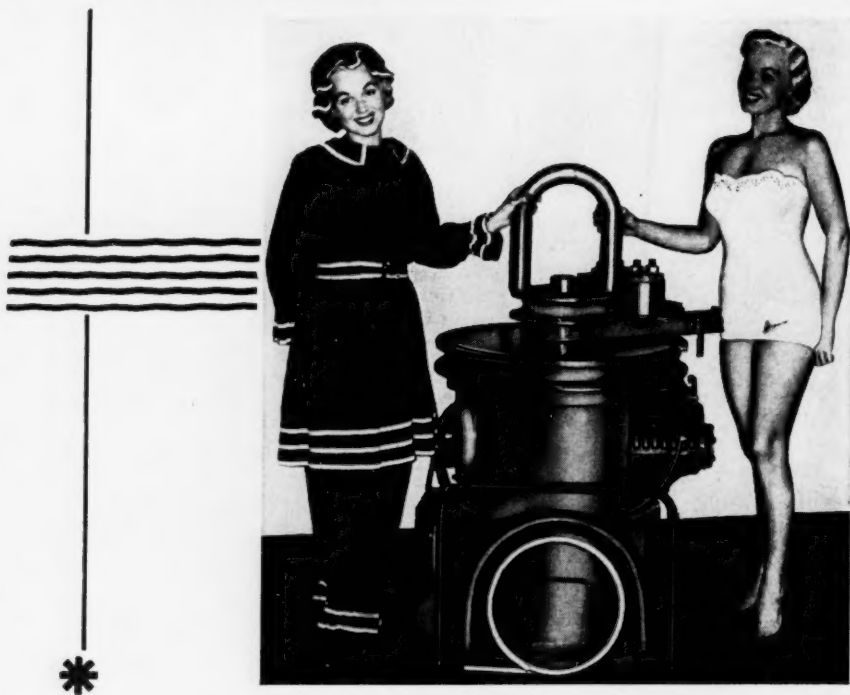
We also make a complete line of floor, bench and radial-type drilling machines.

For complete catalogs, prices and name of your local dealer, write on company letterhead to Cincinnati Lathe & Tool Co., 3260 Disney, Cincinnati 9, Ohio.

# lathes and drills



# PROGRESS 1893-1954



In 1893, the first PEDRICK BENDER was made. That was during the same era when the costume on the left was in style. Here is the latest PEDRICK PRODUCTION BENDER which is as modern as the costume on the right. PEDRICK PRODUCTION BENDERS are now used for cold bending pipe, tube, reinforced bars, angles and many intricate structural shapes.

PEDRICK PRODUCTION BENDER prices start as low as \$1575.00 for the Model "A-3."

WRITE FOR DESCRIPTIVE FOLDER.

**PEDRICK TOOL & MACHINE CO.**

3640 N. LAWRENCE ST.

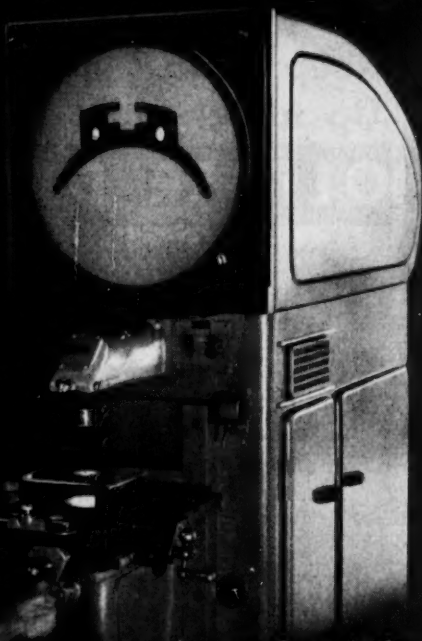
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PHILADELPHIA 40, PA., U. S. A.



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piece parts  
with tolerance  
drawings on  
Bausch &  
Lomb and  
Jones & Lam-  
son compara-  
tors.



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For over a quarter century, Harig has provided America's metal working industry with the finest precision tools man can devise. Highly skilled craftsmen combine their total of more than 1000 years of experience to guarantee you quality that pays off in your production line.

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Another Harig Car-  
bide die designed to  
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parable steel die ten  
to one.



For further information  
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# Harig

*Harig Corporation*

1000 E. 10th St., Grand Rapids, MI, U.S.A.

**Keep Your Toolroom  
Up to Schedule with . . .**

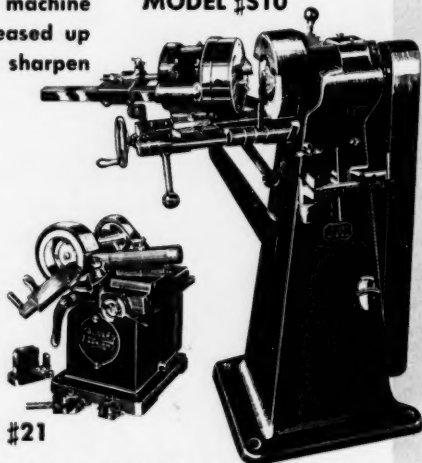
## **OLIVER DRILL POINTERS**



Be Wise, OLIVERize . . . Open your toolroom door to Oliver Drill Pointers. They assure a balanced cut because each lip does equal work, eliminating excessive drill costs and imperfect holes usually traced to improper grinding. Start saving money now — the Oliver Way.

Tests prove that when properly machine ground, twist drill life is increased up to 300%. Oliver Drill Pointers sharpen drills to cut more accurately, last longer and produce more holes. They also reduce power costs. Added drilling pressure from poorly sharpened drills naturally increases the power load. This can't happen with drills ground to precision perfection on Oliver Drill Pointers.

**MODEL #510**



**MODEL #21**

No. 510 for drills  $\frac{1}{4}$ " to 3"—2-3-4 flute. Variable clearances. Variable point angles. Automatic operation.

No. 21 Oliver Bench Grinder. Hand operated for Drills No. 57 to  $\frac{1}{2}$ ". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

Write for our free Booklet

"How To Produce More Holes With Your Drills!"

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**MACHINE TOOLS  
by OLIVER include:**

AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS  
DRILL POINT THINNERS  
TEMPLATE TOOL GRINDERS  
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# **OLIVER INSTRUMENT CO.**

1430 E. MAUMEE • ADRIAN, MICHIGAN

# **NEW 16" Band Saw** with Speeds 50 to 4500 SFM

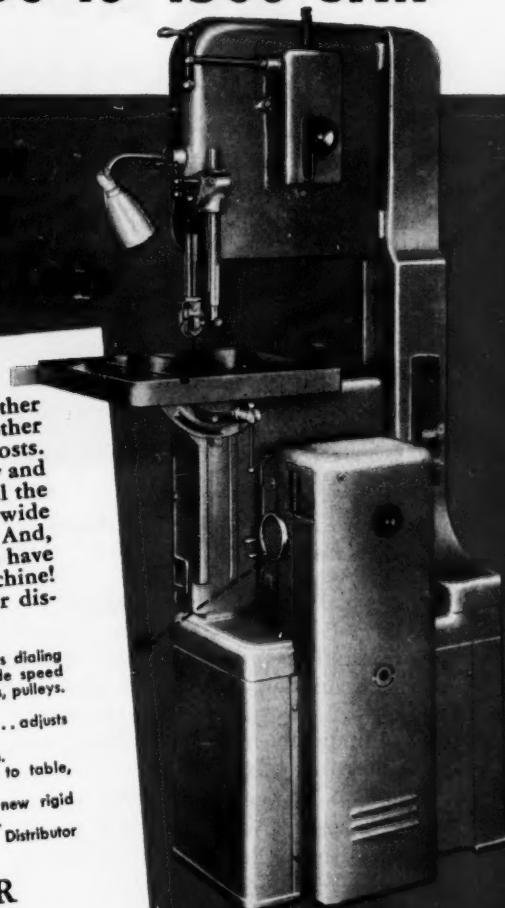
Now, Walker-Turner brings you another *Light-Heavyweight* champ . . . another opportunity to reduce equipment costs. It's a 16" Band Saw with all the quality and efficiency features you want . . . with all the capacity and durability you need for a wide range of jobs, metal, plastic or wood. And, at a **PRICE MUCH LOWER** than you have ever known for any comparable machine! Your factory-trained Walker-Turner distributor is ready to tell you about:—

- \* **Quick-change Variable Speed Drive.** As easily as dialing a radio, you turn the hand wheel and change blade speed smoothly, while machine runs. No need to change belts, pulleys. Speed shows on a graduated scale.
  - Improved Saw Guides.** Upper and lower leaf type . . . adjusts to all blade widths. Ball-bearing rollers.
  - Carter Jiffy Tires** for longer life, smoother operation.
  - Capacity:**—Blade to frame 16 in. Upper guides to table, max 8 in.
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DRILL PRESSES—Hand and Power Feed • Radial Drills • Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS • RADIAL SAWS • JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS  
BELT AND DISC SURFACERS • FLEXIBLE SHAFT MACHINES

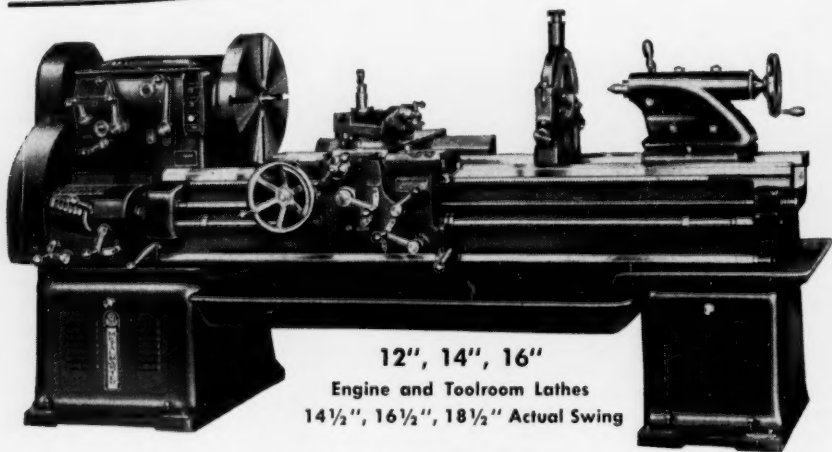


OLD THROUGH FACTORY TRAINED  
SELECTION DISTRIBUTORS

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to send for full details and specifications.  
Walker-Turner Division, Kearney & Trecker Corp.  
Dept. MM-1, Plainfield, N. J.

For Dependable Accuracy!  
**BRADFORD**  
METALMASTER LATHES



12", 14", 16"  
Engine and Toolroom Lathes  
14½", 16½", 18½" Actual Swing

**BRADFORD Metalmaster**  
Geared Head Lathes have earned an enviable reputation throughout the years for high efficiency and dependable accuracy. But today's new Metalmaster is even finer! Built to the most exacting standards of workmanship, and of the finest materials and components, these new Metalmaster Lathes are equipped with many outstanding features.

**POWER** for Your Job: 2 HP to 10 HP.  
**SPEEDS** for Your Job: 16 RPM min. to  
1000 RPM max.

**FEEDS:** .00072 to .1780.  
**THREAD RANGE:** 1½ to 368, including  
11½ and 27 without extra gearing.

• Let our Engineers solve your lathe problems. Write for Bulletin 179.



**THE BRADFORD MACHINE TOOL COMPANY**

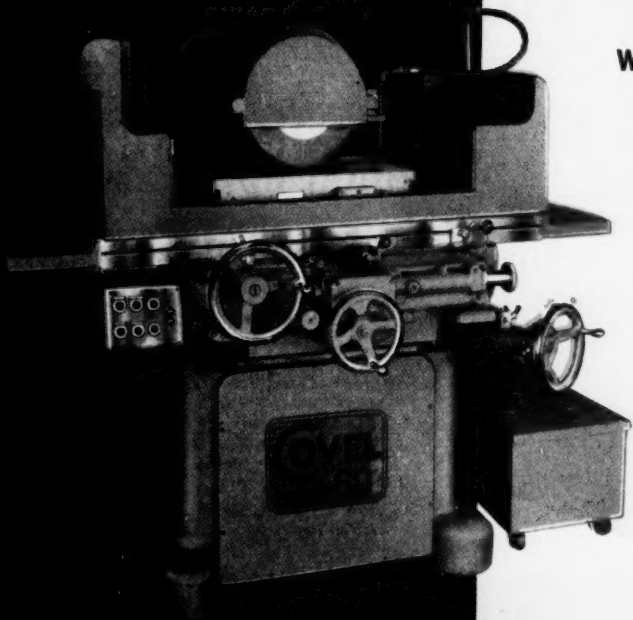
658 Evans St., Cincinnati, Ohio

Precision Since 1840

**DELIVERIES: 30 days, subject to prior sale**

# COVEL No. 60 SURFACE GRINDER . . . ENTIRELY *NEW*

WITH *15"* CROSS FEED



#### Here's a Typical Use:

This new "60" is set up for wet grinding the surface of a trim die for die castings — but one of the wide range of tool room and production jobs for which this latest Covell grinder is suited.



WRITE  
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*New*  
*Bulletin*  
No.  
M-14

*80* YEARS of  
continuous manu-  
facturing experience  
makes your COVEL  
choice a sound one

## COVEL PRECISION GRINDERS

BENTON HARBOR, MICHIGAN

DRILL GRINDERS • UNIVERSAL CUTTER & TOOL GRINDERS • HYDRAULIC & HAND FEED SURFACE GRINDERS



with

# NEW

## Fosdick BF Spindle

### change boring tools repeat hole size

No more "cut and try" resetting of boring tools every time you change them! With the new BF Spindle you can change tools in seconds with such accuracy that hole sizes are repeated within  $\pm .0001"$ , *without* resetting. Slash time drastically, whether boring a "one-shot" jig with many different size holes or producing work where repetitive precision is essential.

*Fast tool changing with  
Automatic Positioning for  
High-Speed, Precision Boring  
to a NEW Degree  
never before obtainable.*



Drop duplicating bars in place—position work for first hole and bore. Then...



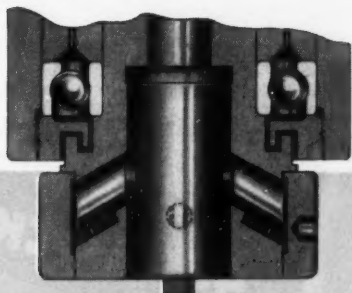
PRESS the button—and in the twinkling of an eye—you're positioned within  $\pm .0001"$  for the next operation.

Fosdick builds Automatic Positioning into its Jig Borers to give you  $\pm .0001"$  table positioning in *seconds* simply by pressing a button—even with inexperienced operators. Only two easily-made, easily-stored duplicating bars are needed for each job. Once bars are set, work initially positioned, press button and, in seconds, you're ready for the next operation! This is Fosdick's precision combination—One hole or a thousand, same size or different, you'll hold both position and hole size to  $\pm .0001"$ !

*For more information write  
for these bulletins: Fosdick  
Jig Borer... Bulletin 42S  
Automatic Positioning  
..... Bulletin 42PS  
BF Spindle... Bulletin BFS*



in seconds...  
to  $\pm .0001$ " without resetting



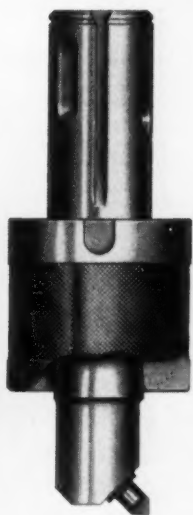
High-precision tool holder is built integral with Jig Borer spindle. Straight-shank tool adapters fit holder precisely — wipe surface clean as tool is inserted, keep dust and dirt from upsetting precision fit. Both adapters and tools "keyed-in" for identical repositioned accuracy.



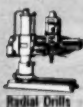
With the BF Spindle, you can change boring tools while the machine positions. Simply loosen cam ring with spanner wrench. Further hand rotation releases tool.



Then insert new tool, tighten cam ring and you have Fosdick's precision combination—tool changing and work positioning both to  $\pm .0001$ " in a matter of seconds!



*Need Drilling Equipment? Get a Proposal from Fosdick!*



Radial Drills



Jig Borers



Sensitive and Upright Drills



Sensitive Radial Drills



Automatic Positioning Machines

**FOSDICK**

**THE FOSDICK MACHINE TOOL CO., CINCINNATI 23, OHIO**

Accuracy  $\pm .000008''$   
**\$165<sup>00</sup>**  
**43 BLOCK SET**



Specially selected sizes for the small shop or a standby set where additional blocks are a needed convenience.

Keep a second set with wanted sizes available on instant notice. Avoids delay or even error that might result from using substitute gaging methods.

The 43 Block Set (43 B) has accuracy of  $\pm .000008''$  and must pass the same test for surface finish, flatness and parallelism of the finest grade of steel blocks.

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**GAGE BLOCKS**  
**and ACCESSORIES**

**WEBBER GAGE COMPANY**  
12899 Triskett Road • Cleveland 11, Ohio

Largest exclusive manufacturer of  
precision gage blocks

Send inquiries direct to Webber Gage Company



#### What's different about VIXEN FILES?

Vixen is the original and still the best. These milled curved tooth files cut freer, faster, smoother because:

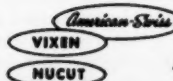
1. Milled curved teeth are actually miniature milling cutters.
2. Gullets are not pointed but rounded, to make chips fall free easier.
3. Undercut teeth have distinct cutting action, do not scrape or abrade.
4. Special analysis chrome steel keeps teeth sharp longer.
5. Vixens may be resharpened many times.

**ASK YOUR HELLER  
DISTRIBUTOR FOR  
COMPLETE INFORMATION**

#### The Milled Curved Teeth of Vixen

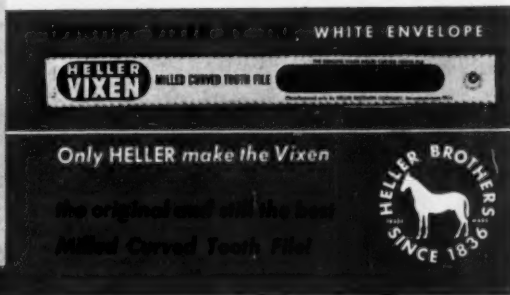
Files have deep gullets and wide pitch to prevent clogging. This eliminates tracking or serrating and leaves a scratch-free work surface. Made of special analysis chrome steel, Vixen's undercut teeth remain keen longer. Vixens are available in all types of milled curved teeth files—a *complete line*.

THESE FAMOUS FILES ARE  
MADE ONLY BY



**HELLER BROTHERS CO.**

*America's Oldest File Manufacturer*  
**NEWCOMERTOWN, OHIO**



Only HELLER make the Vixen

*the original and still the best  
Milled Curved Tooth File*



*for that last hundred-thousandth*

**The**  
**WK** **LIGHT WAVE**  
**MICROMETER**  
0 to 3"



**Catalog  
and  
Handbook  
No. 35**

The Van Keuren Light Wave Micrometer is an instrument of exceptional accuracy, ideal for measuring plug gages or small precision parts. Use it when you're after "that last hundred thousandth" involved in so many of today's measurements. The 0 to 3" instrument shown above has a 1/2" diameter, 40 threads per inch micrometer screw, which can be made with greater accuracy, and which has 3 times the wearing surface of an ordinary micrometer screw. It has an 8" diameter micrometer

wheel, with .0001" graduations 1/10" apart. It has a non-parallax vernier index which enables readings to be made to .00001". It has an index lock and carbide-tipped anvil and spindle. This sturdy, sensitive instrument weighs only 17 pounds, and is in reality a portable measuring machine of inbuilt and sustained accuracy. The Light Wave Micrometer is not a comparator. No gage blocks are needed and no errors creep in from worn blocks. It is a direct source of dependable precision . . . fast, accurate and profitable.

This 220-page volume represents years of research by the Van Keuren Co. It presents a simple and exact method of measuring screws and worms with wires, tells how to measure gears, splines and involute serrations. It is an accepted reference book for measuring problems and methods. Ask for your copy . . . sent free on request by writing: The Van Keuren Company, 175 Waltham St., Watertown, Mass.

**WK**

**35th YEAR**

THE *Van Keuren* CO.

**175 WALTHAM STREET, WATERTOWN, MASS.**

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carbide Cemented Carbide Plug Gages • Carbide Cemented Carbide Measuring Wires • Chrome Carbide Taper Insert Plug Gages

an  
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product

Sphero-Conical  
DIAMOND **BRALE**\* PENETRATOR  
for Hardened Steel

**HOW IT WORKS**

- A. Minor Load Penetration
- B. Major Load Penetration
- C. Linear measurement of penetration increase which "ROCKWELL" converts to hardness reading



***BRALE Penetrator Accuracy Is Proved  
in Wilson's Standardizing Laboratory***

● One point of hardness on the Rockwell C scale equals .00008" so penetrator accuracy must be constant. That's why Wilson maintains its Standardizing Laboratory for testing on many test blocks and approving every BRALE penetrator.

Each BRALE is precision ground to shape under high magnification and is accurate to the degree required for a research laboratory. Wilson's BRALE Penetrator gives true readings at all points on the dial. To get the greatest accuracy from your hardness tester, see that it is equipped with a diamond BRALE penetrator.

\*Trade Mark Registered

**ACCO**

Write for literature

WILSON MECHANICAL INSTRUMENT DIVISION  
AMERICAN CHAIN & CABLE

TRADE  
MARK



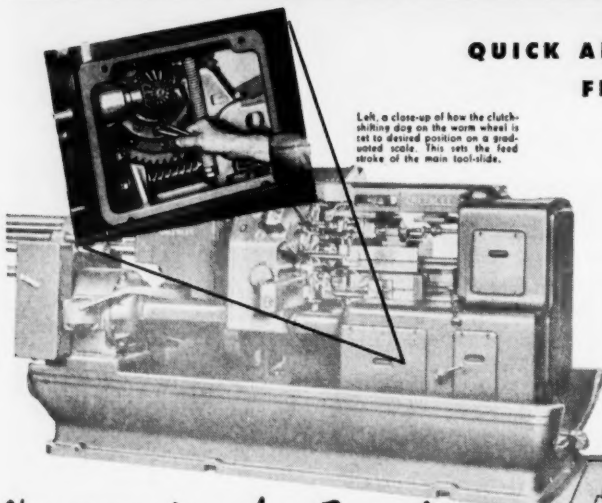
**WILSON  
"ROCKWELL"  
and TUKON  
Hardness  
Testers**

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# GREENLEE

*Automatics*

## QUICK AND EASY FEED STROKE ADJUSTMENT

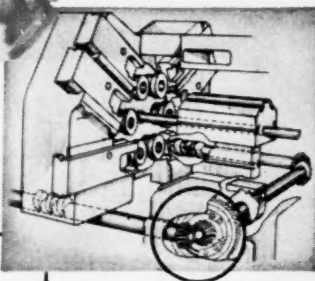


Left, a close-up of how the clutch-shifting dog on the worm wheel is set to desired position on a graduated scale. This sets the feed stroke of the main tool-slide.

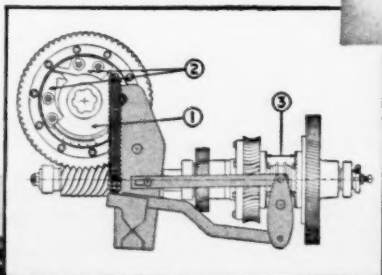
On Greenlee Automatics, main tool-slide feed stroke adjustments are made by adjusting only one dog on a graduated worm wheel, as illustrated by the inset picture at the left. The details of this arrangement, and particularly the relation of the worm wheel to the main tool-slide drive, are shown and explained in the other pictures and captions.

### *Changes can be made in 5 minutes*

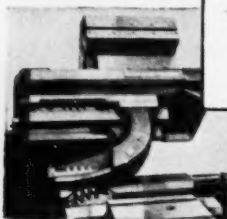
Precise adjustments of the main tool-slide stroke can be made easily in less than five minutes. To save time in making preliminary settings, two additional scales are provided, one on each side of the tool-slide, with graduations corresponding to those on the worm wheel.



The drawing at the right shows how the clutch, worm and worm wheel, and clutch-shifting lever are related. Numbers indicate (1) the graduated worm wheel, (2) the clutch-shifting dog, and (3) the main drive clutch.



At the left is a view of the tool-slide removed and tilted back. The intermittent feed gear provides a full stroke each cycle, with fast approach and a smooth shift into feed. The main clutch is shifted automatically.



The cutaway diagram above shows, in the circle, the location of the graduated worm wheel on the end of the shaft that carries the intermittent feed gear.

Write for FREE  
Literature



GREENLEE BROS. & CO.  
1881 Mason Ave., Rockford, Ill.



# "AMERICANS" NORDBERG

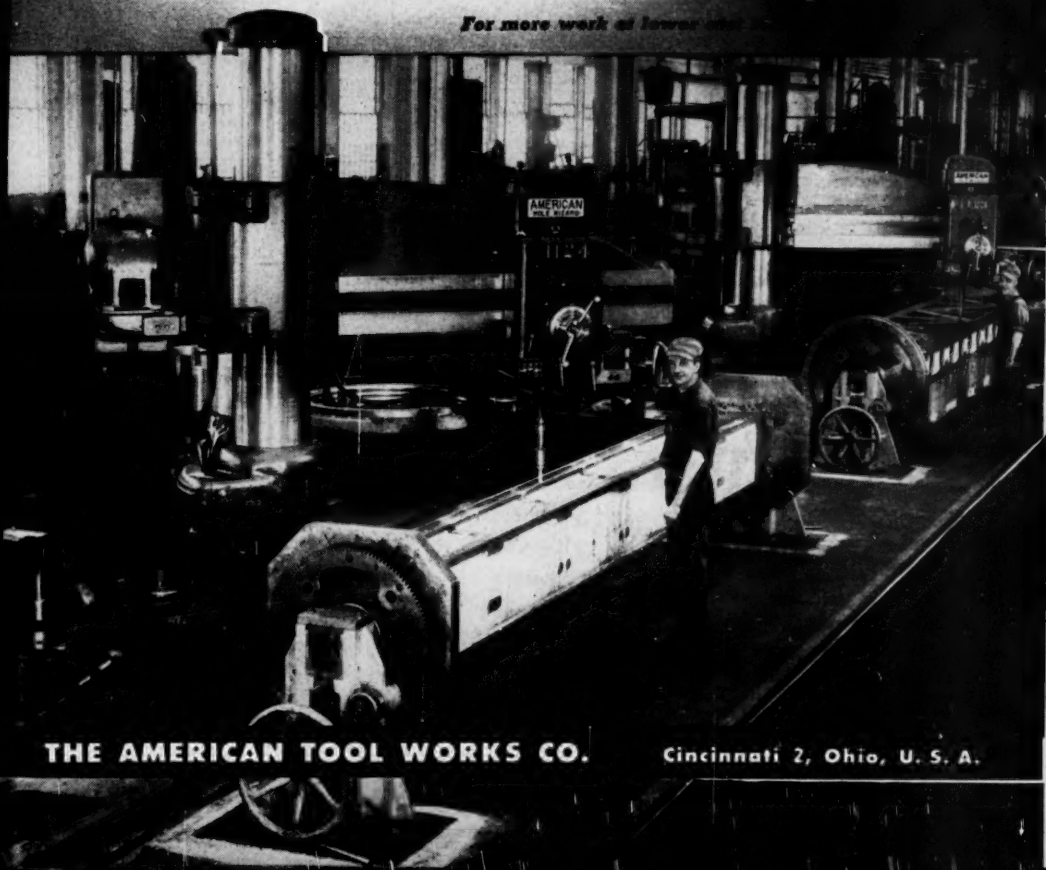
These "AMERICAN" Track Type Hole Wizard Radials mounted on mobile bases speed up drilling, tapping and boring operations in long, heavy work pieces by bringing the tool to the work rather than moving the work to the tool.

The work pieces are mounted in elaborate trunnion jig fixtures so different work planes may quickly be presented to the tool and a high degree of accuracy maintained.

The quality of Nordberg products is universally recognized. We are proud indeed that so many "AMERICAN" Lathes and Radial Drills contribute to it.

helping to profitably  
produce the quality  
products for which  
Nordberg Manufac-  
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Milwaukee, Wisconsin  
is known the world  
over.

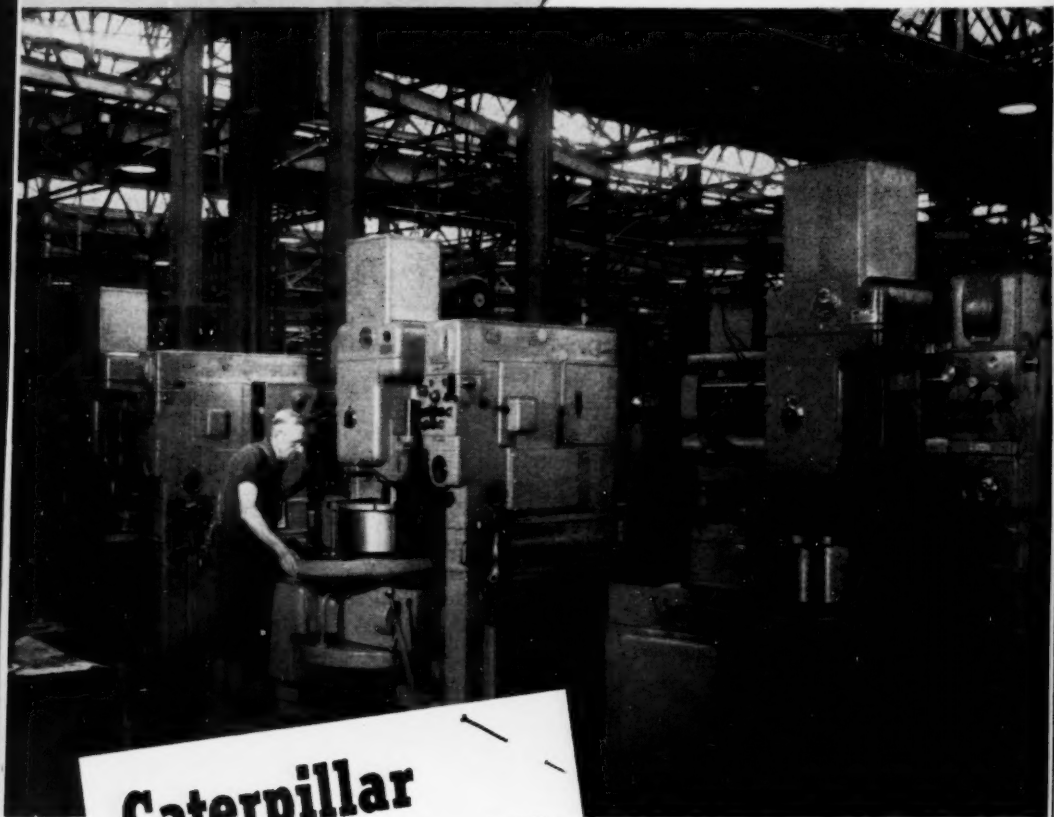
*For more work at lower cost*



**THE AMERICAN TOOL WORKS CO.**

Cincinnati 2, Ohio, U. S. A.

## Report from Peoria...on Big-Gear



### Caterpillar

REG. U. S. PAT. OFF.

*selects Fellows 36-Type Gear Shapers\*, at its Peoria Plant, for high production on unusually wide-face steering clutch drum gears for its Track-type Tractors and No. 6 Shovels.*

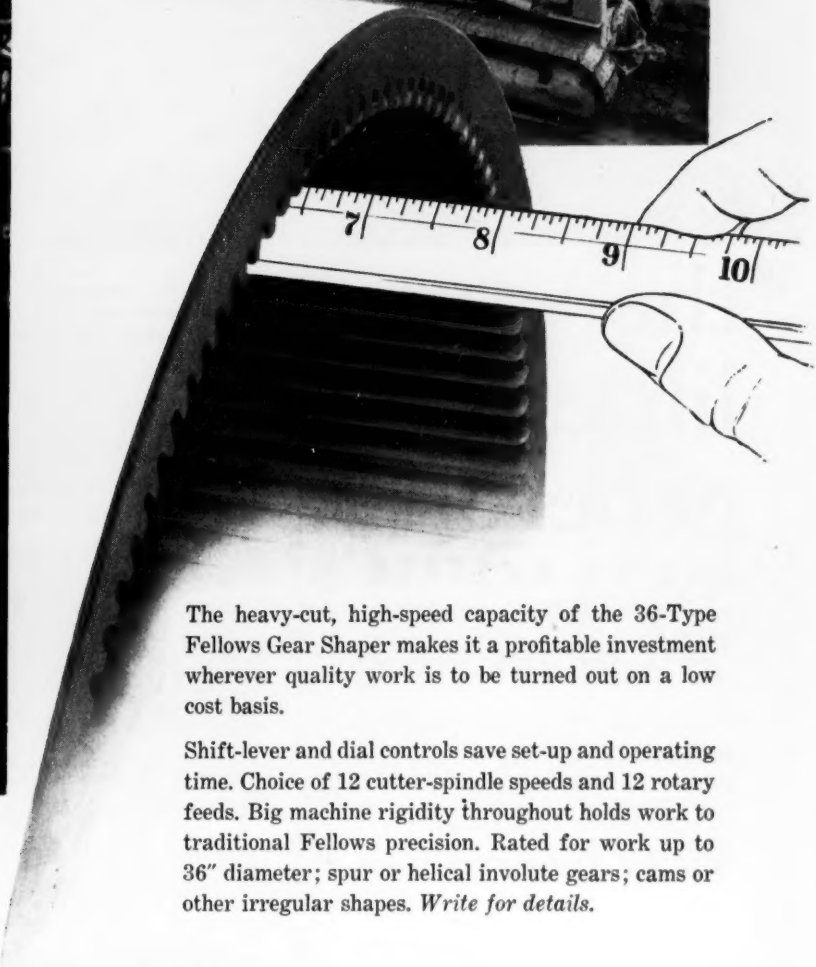
\*Specially arranged for 8" face-width; standard face-width capacity is 6".

Time-study Performance: Internal C.I. Gear with 128 8-pitch teeth of 8 inches face width—ACTUAL CUTTING TIME, 29.339 MINUTES. Finished in one cut with Gear Shaper operating at 50 strokes per minute, .0408" rotary feed.

THE

# Fellows

# Cutting

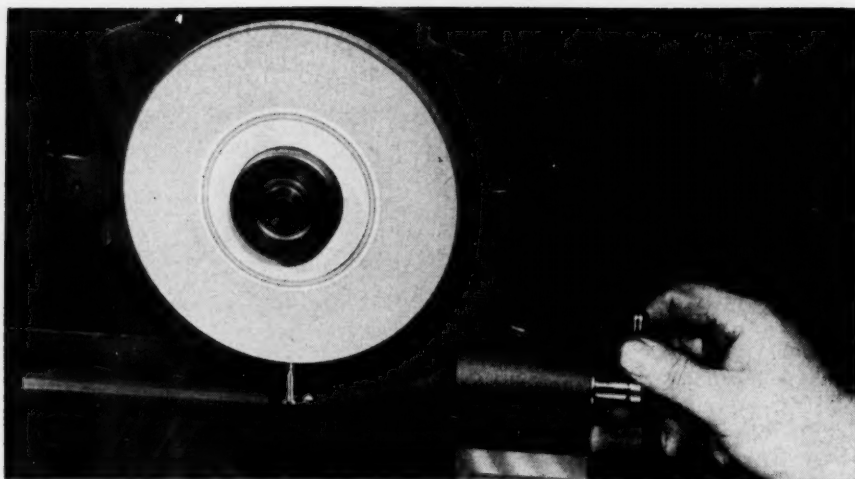


The heavy-cut, high-speed capacity of the 36-Type Fellows Gear Shaper makes it a profitable investment wherever quality work is to be turned out on a low cost basis.

Shift-lever and dial controls save set-up and operating time. Choice of 12 cutter-spindle speeds and 12 rotary feeds. Big machine rigidity throughout holds work to traditional Fellows precision. Rated for work up to 36" diameter; spur or helical involute gears; cams or other irregular shapes. *Write for details.*

## GEAR SHAPER COMPANY

Head Office and Export Department: 78 River Street, Springfield, Vermont.  
Branch Offices: 323 Fisher Building, Detroit 2 • 5835 West North Avenue, Chicago 39.  
2206 Empire State Building, New York.



**\*the  
little  
general  
RADIUS DRESSER**

\*Pat. App. For

**assures  
"FEEL OF THE WHEEL"**

**RANGE:** Radius of .001 and .002 (needle diamond permitting) up to 9/16". Diamond concentricity is adjustable at all times, allowing a perfect radius to be dressed.

**PRICE: \$47.50** (diamond not included)

**\***

This precision instrument is newly designed to give the machinist perfect "feel of the wheel" when dressing a radius. The "Little General" is a rugged tool, extremely smooth, rigid and simple to use. Angles tangent to radii are rapidly and easily dressed . . . radius dimension can be set quickly and accurately.

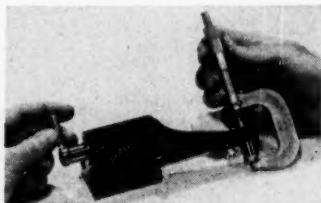


Illustration shows simple setting operation of Little General Radius Dresser

For further information contact your jobber or write direct to:

*General Scientific*

Dept. M-1, 603 N. La Brea Ave. Los Angeles 36, Calif. • WYoming 3104

**STOP LOOK**

...at this new  
**Medium Weight  
 DRILLING MACHINE**

*it's not too light  
 - not too heavy!*

Wt. 765 lbs.—25" Swing—Large Rectangular Table with Coolant Trough—Variable Speed Drive for any size drill from  $\frac{1}{8}$ " to 1" —1½ H.P. Axial Air Gap Motor—Tachometer shows exact spindle speed...

**Features exclusive on this machine, make the new...**



**SIBLEY**

Machine & Foundry Corp.

South Bend 23, Indiana

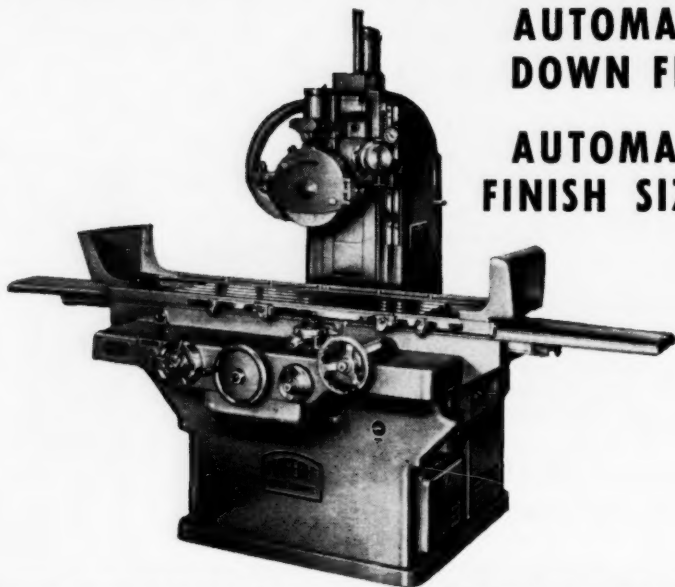
**SIBLEY MACHINE & FOUNDRY CORP.**  
 33 East Tutt St., South Bend 23, Indiana  
 Send Catalog No. 69, Free!

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Company \_\_\_\_\_  
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 City \_\_\_\_\_ State \_\_\_\_\_

# MÄGERLE (SWISS) HYDRAULIC SURFACE GRINDERS

**AUTOMATIC  
DOWN FEED**

**AUTOMATIC  
FINISH SIZING**



- A work measuring instrument shows the difference between work size and required final size during operation.
- The automatic feeding and sizing is powered by a separate electrical unit.
- The built in diamond wheel dresser automatically resets the final sizing mechanism for wheel wear.
- The machine requires no attendance during the grinding operation.
- Finishes within .0002 are secured on repeated chuck loadings automatically.
- Rapid traverse is provided for both head and cross-slide.
- Furnished with heavy duty cartridge spindle assembly.
- Available with infinitely variable grinding wheel speed.
- Extremely rugged construction and very easy to operate.
- Available in 2 foot, 3 foot and 4 foot models.

*Write for our eight page illustrated brochure.*

**PELLOW MACHINE CO.**

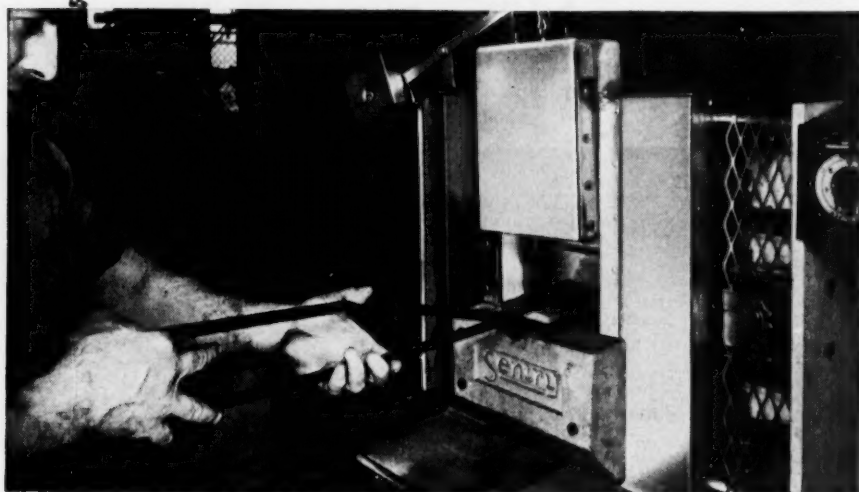
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# ELECTRIC FURNACES

## \* FOR H.S.S. hardening



## Heat Treats 14,000 Taps Daily at JARVIS TAP

This is a key point mass production operation at Jarvis Tap, N. Attleboro, Mass., where speed and dependability are essential. Frank DeLucia, Supt., insists on Sentry Furnaces with the Sentry Diamond Block atmosphere because he knows this combination will prevent hardening variables and maintain consistent high quality. A battery of Sentry units keeps their production running smoothly.

*Sentry Furnace shown above is Size 2, Model Y.*

For optimum hardness with complete protection against scale or decarburization, heat treat H. S. steels with Sentry Model "Y" Furnaces and Sentry Diamond Blocks.

Illustrates and describes all sizes of Models Y and YP Furnaces and The Sentry Diamond Block Method



Actual size of tap. 14,000 of these and other size taps must be scientifically heat treated daily.



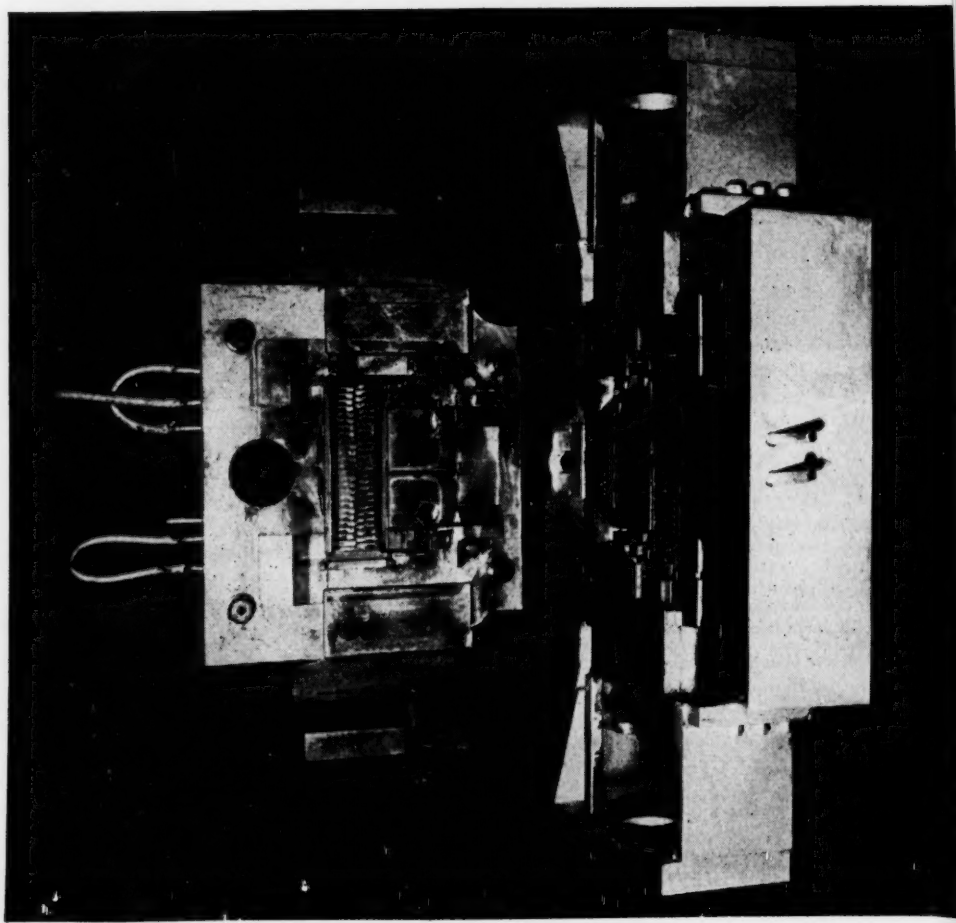
Request Catalog J-15  
January, 1954



## THE SENTRY COMPANY

MODERN MACHINE SHOP 61

*No matter  
what your  
**DIE-CASTING**  
**JOB**  
maybe...*



# Accuracy calls for POTOMAC M Hot Work Die Steel

## "HOT- WORK STEELS"

is the title of a new, six-page folder that tells about the chromium, molybdenum, vanadium Hot Die Steel known as POTOMAC M—and also covers other grades for other hot-work operations. Secure your copy—*write today!*

ADDRESS DEPT. MS-49

In the precision casting of aluminum, POTOMAC M Hot-Work Die Steel is especially favored as the material for die-casting dies because its properties help assure accuracy of the steel itself *after* heat treatment. Die makers have found that size changes are held to a minimum. Dimensional stability is thus the *first* contribution that POTOMAC M makes to accuracy.

Production accuracy of the die after it is in service is maintained also by the

resistance of POTOMAC M to wear, to heat checking, and to metal wash.

Allegheny Ludlum makes a complete line of steels for hot-work tooling of various kinds—so, whether your need is the mass producing of duplicate parts or fabricating a few of them, call up or write "A-L" every time for hot-work counsel or service or both. Just tell us your requirements.

• *Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*



For complete MODERN Tooling, call  
**Allegheny Ludlum**

WARD 3724

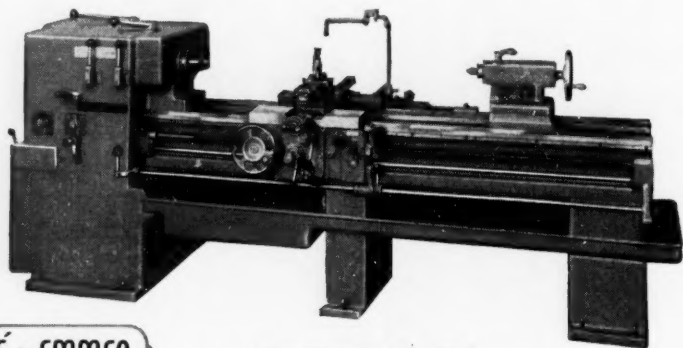
IN  
**1895**



**BOYÉ & EMMES**  
LONG LIFE  
ENGINE LATHES  
*looked like this!*

...In that year the Boyé & Emmes design featured a single back gear, which doubled the number of spindle speeds previously considered adequate.

*Today* **BOYÉ & EMMES LONG LIFE ENGINE LATHES**  
incorporate the accumulated know-how of fifty-nine  
consecutive years of exclusive engine lathe manufacture.



**BOYÉ & EMMES**  
MACHINE TOOL COMPANY  
123 CALDWELL DRIVE  
CINCINNATI 16, OHIO  
MACHINE TOOL CENTER of the WORLD

For full information about Boyé & Emmes extended range of spindle speeds and other modern design changes write for FREE Bulletin 5305. Ask also for our new folder "Fifty-Nine Years of Engine Lathe Evolution."

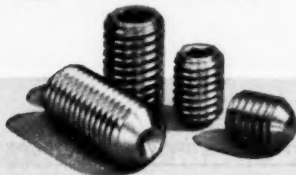


**NEW**  
*Allenpoint Set Screws*

**WITH SCIENTIFICALLY-DESIGNED SMALLER CUP POINTS**

Tested comparatively by United States Testing Company\* with standard cup point screws and screws with angled and serrated points, the new Allenpoint demonstrated (1) greater locking power at *all* measured installation vs removal torque pressures, (2) uniformly high shaft holding power in torque resistance tests, (3) unmatched performance under vibration, and (4) more complete shaft contact pattern. Sold *only* by leading Industrial Distributors. Write us for more facts about the results of these important tests of set screw performance.

\*Report No. E 5576, March 17, 1953.



**ALLEN**  
MANUFACTURING COMPANY  
Hartford 2, Connecticut U.S.A.



## ROCKFORD *Hydraulic* SHAPERS

Rockford Openside Shapers provide numerous improvements in the production of small planing and large shaping work. Reciprocation of the work, instead of the tool, provides planer accuracy, eliminates overhang and reduces wear. Stroke lengths, feed and cutting speeds are quickly adjustable within the range of the machine.

A wide variety of sizes—36", 48", 60", and 72" stroke are available.

Investigate these shapers . . . as modern in machine tools as tomorrow's jets.

A Rockford Machine Tool Co. representative will give you complete information.

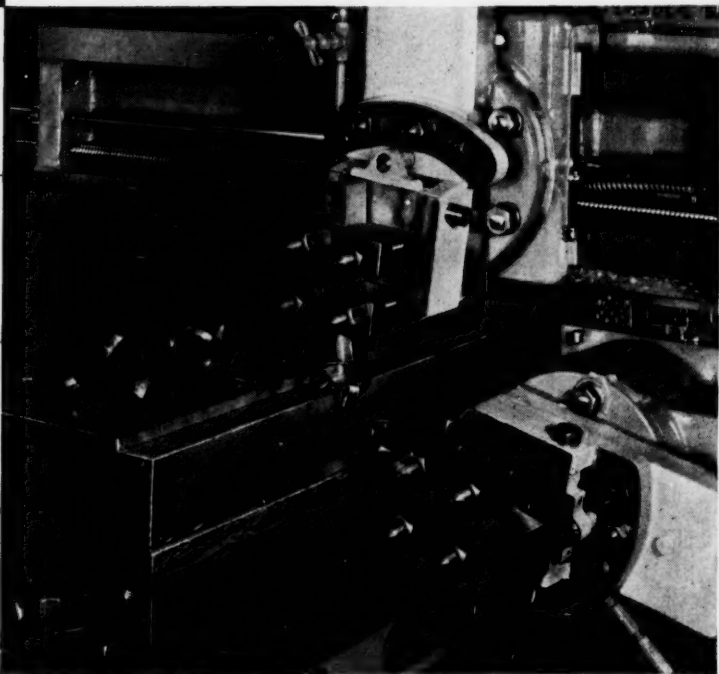
### FEATURES:

Side  
Head

Hydraulic  
Tool Lifters  
(For Rail  
and Side  
Heads)

Power Rail  
Elevation

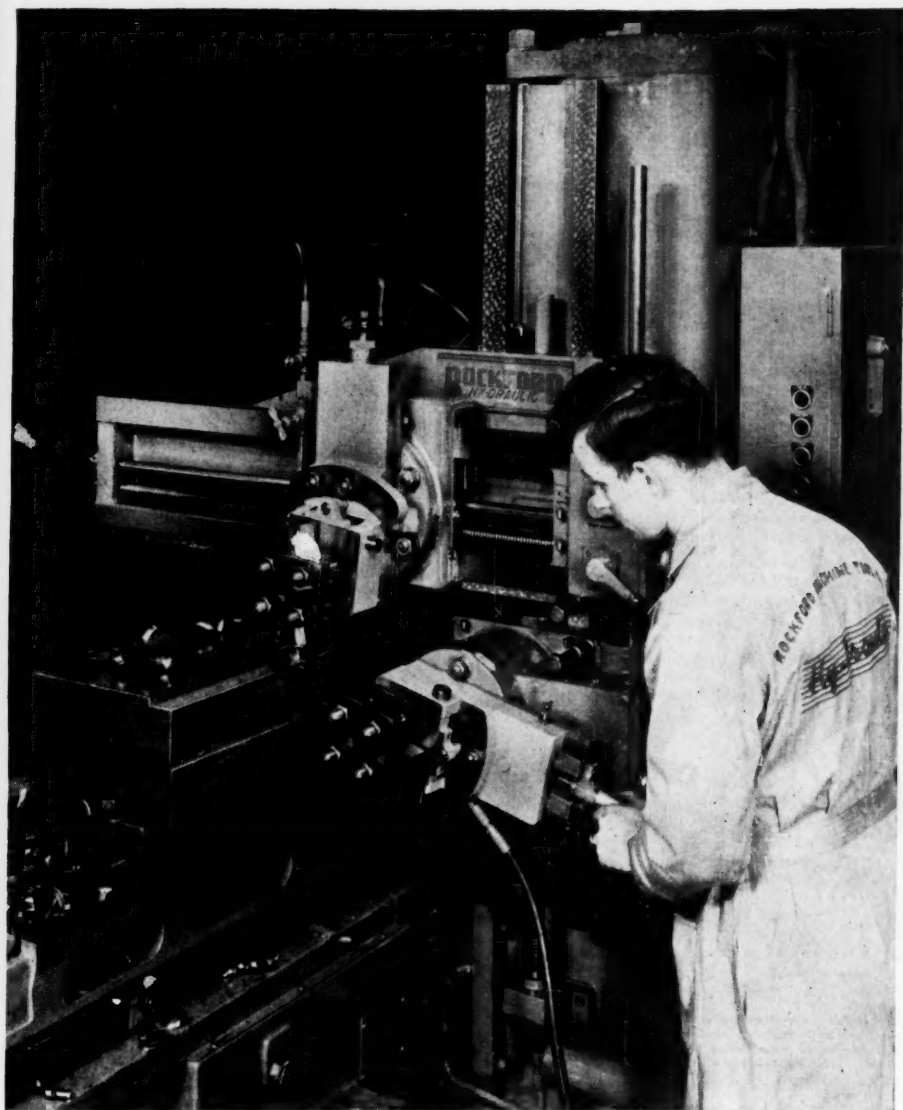
10 hp 1200 rpm  
220/440 volt  
3 phase 60 cycle  
Open Ball Bearing  
Motor and Control



*shaping • planing • duplicating • turning*







Rockford Machine Tool Co. Rockford, Illinois

**NILSON  
FOUR-  
SLIDE**

*It's easy to get*

**HIGH PRODUCTION**

*... and UNIFORMITY, too!*

## Wire and Ribbon Metal FORMING MACHINES



**U**NIFORMITY in automatic production doesn't come by chance! In the case of wire and ribbon stock forming on NILSON 4-SLIDES, it means control of the material from the coil to the final form.

Parts, such as illustrated, are produced to tolerances of .002 at critical dimensions. Dies and forming tools, once installed (faster and simpler with NILSON'S open construction) maintain close tolerances for short and long runs. One machine! One set-up! Increased production! Maximum uniformity!

Model SF3 NILSON 4-SLIDE, shown above, with No. 51B Tilting Stock Reel, is a complete unit that can be set-up in any convenient location.

### Range of sizes

**Wire Forming —**  
1/32" through 1/2" wire. Feeds up to 32'.

**Ribbon Stock Forming —**  
1" through 3 1/2" wide material. Capacity of press section 5 to 30 tons; 50 to 75 tons in heavy duty types.

### For specific

**recommendations**

— send details of  
your operation.



Close-up of the NILSON forming section with the built-in Horizontal Press to the left. This design eliminates secondary handling and insures product uniformity because the sequence of stamping and forming is automatically controlled.



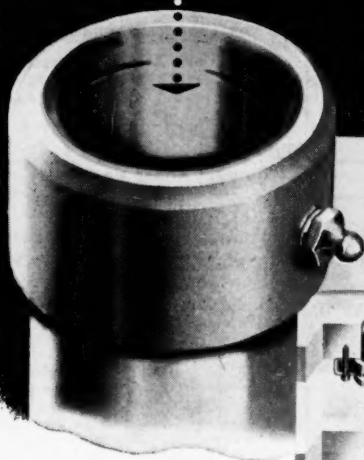
Close-up of the NILSON feed mechanism... capable of feeding wire and ribbon metal to tolerances of .001. Another important element in insuring product uniformity. Positive control is maintained over the material regardless the length of feed.

THEY'RE FORMING LIKE A  
**NILSON**

THE A. H. NILSON MACHINE COMPANY  
1514 Railroad Avenue • Bridgeport 3, Connecticut  
CHICAGO • CLEVELAND • DETROIT • LOS ANGELES • HAMILTON, ONT. CANADA

Automatic Chain Making Machines • Automatic Staple Forming Machines • Wire and  
Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses

the  
**BIG**  
difference  
is  
an  
**INSIDE**  
story..



**Lamina**  
DIES AND TOOLS, INC.

**Lamina**

## GUIDE PIN BUSHINGS

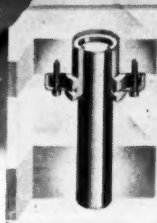
The **BIG** difference in Lamina Guide Bushings—lower maintenance costs, longer die life, fewer part rejects and press shut-downs—is the free-running bronze plating on long-wearing hardened steel.

Used with Lamina Guide Pins, these bushings provide a precision combination that assures better die alignment—less die wear. And because Lamina Bushings are hardened steel under the bronze bearing surface—pins are water-hardening tool steel—they keep that precision for thousands of extra press strokes without wear or distortion. Yet the smooth, free-running bronze bearing surface eliminates possibility of seizure.

For lower production costs and more consistent quality on all your stamped parts, specify Lamina Guide Bushings and Pins... both for replacement and when ordering new die sets. Our new illustrated bulletin and price list tells the whole story. Contact your die set manufacturer or write direct to us for your free copy.

## SPECIFY **Lamina** GUIDE PINS, TOO!

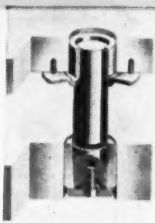
Lamina also produces a complete range of precision guide pins. Made of water-hardening tool steel, Lamina Pins eliminate "mush-rooming" during assembly—add years of service. Available in straight, shoulder and removable styles.



STRAIGHT PINS



SHOULDER PINS



REMOVABLE PINS

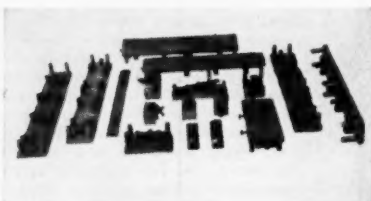
14925 W. ELEVEN MILE RD. • BERKLEY, MICH.

# YOU GET *SPEED* PLUS ACCURACY WITH

## MOORE JIG BORERS

### IN THE TOOLROOM

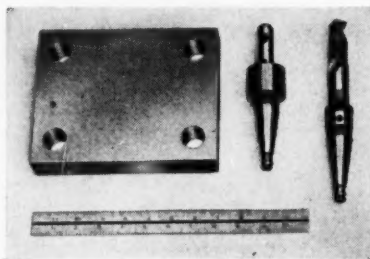
400 holes to "tenths"—5 to 7 minutes each on the No. 1 Moore Jig Borer



Manufacture of this group of drill jigs involves accurately locating, drilling and boring approximately 400 holes. The No. 1 Moore Jig Borer finished them to "tenths" in from five to seven minutes per hole.

### ON PRODUCTION

64 holes to  $\pm .0002$ "—2 minutes each on the No. 2 Moore Jig Borer



Sixteen pieces like this were located, drilled, bored and checked on a No. 2 Moore Jig Borer with one drill and one carbide bit. The 64 holes were finished in 2 hours and 8 minutes (plus 30 minutes setup) with location and size tolerances  $\pm .0002$ ".

Only a precision machine geared to the high American production standards of ruggedness and accuracy can meet these performance requirements. For versatility and speed in spotting, drilling, reaming, boring and checking operations in production as well as tooling, no other moderately-priced machine tool compares with the Moore Jig Borer. And there's no sacrifice of accuracy for speed, since the lead screw measuring system built into each Moore machine permits working to the closest of tolerances.

You'll find that the Moore Jig Borer can pay for itself—in *jig time*. Write today for detailed bulletins.

Moore Special Tool Company, Inc.  
730 Union Avenue, Bridgeport 7, Conn.

**NO. 1 MOORE JIG BORER**  
Table working surface of 10"x16". Over 1200 now in use throughout the world. The ideal small, accurate jig borer. Lead screws accurate to .0002" in 16".



**NO. 2 MOORE JIG BORER**  
Table working surface of 10"x19". Heavier cuts, larger holes. Features infinitely variable spindle speeds, three power feed ratios, centralized control panel.

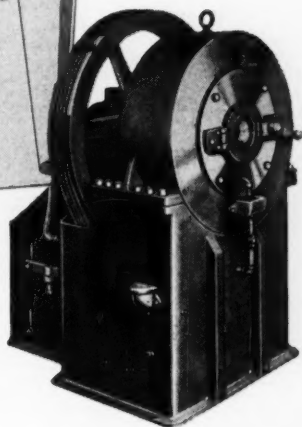


# ADD TO YOUR TOOLROOM

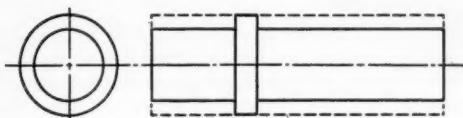
JIG BORERS • JIG GRINDERS • PANTO-CRUSH WHEEL DRESSERS • DIE FLIPPERS • MOTORIZED CENTERS • HOLE LOCATION ACCESSORIES

see our catalog in  
  
or write for copy

# Swaging Success Stories

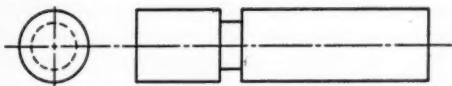


## Quicker, Better, Cheaper

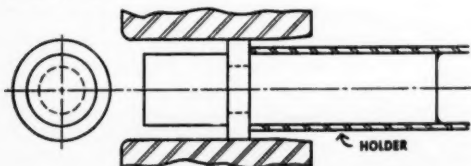


This part was originally turned on a special machine to produce the desired collar or spring seat. The dotted lines indicate wasted, excess material.

Then this manufacturer investigated swaging. Look at the results:



A blank rod with the same diameter as the turned piece was grooved. This provided the location for a ring to be positioned by means of a holder.



Then the ring was swaged firmly into place. Final results—the same as the expensive screw machine piece.

## Can You Use Savings Like These?

1. Savings in material—swaging here uses nearly all the metal.
2. Savings in labor—swaging can be done by unskilled hands.
3. Increased output—swaging is fast.
4. Improved products—swaging toughens metal, gives it better resiliency, hardness, finish.

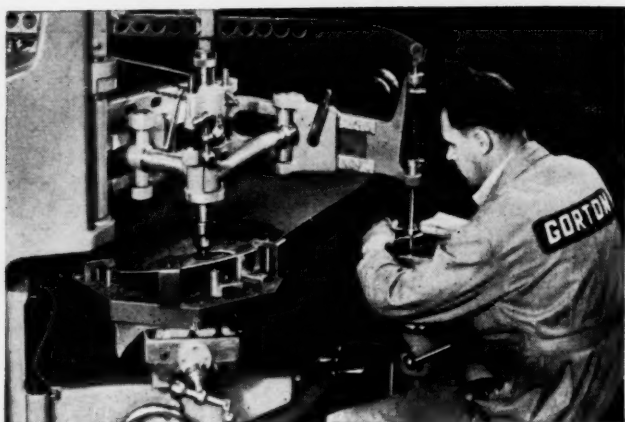
We'll be glad to send you an informative booklet on swaging that contains complete descriptions of Torrington Rotary Swagers. Ask for it today; it may save you money tomorrow.



## THE TORRINGTON COMPANY

Swager Department  
730 North Street, Torrington, Conn.  
Makers of Torrington Needle Bearings

# TORRINGTON ROTARY SWAGING MACHINES



Tracer-Controlled Pantograph cuts and rounds thermal slot in 8-foot steel propeller blade in 40 minutes; previous time was 5 hours, 10 minutes — just one of hundreds of examples of time and cost saving with tracer-controlled Pantograph machines.

## Pantography IS NEW —

**By George Gorton III**  
Executive Vice President  
George Gorton Machine Co

— in the sense that industry at large and Metal Working people in particular are just beginning to appreciate the many advantages Pantography offers to those faced with the Design-Production problems of today and tomorrow.

**I**NDUSTRY'S foremost responsibility right now is to produce faster, to highest quality standards and at lower cost — whether on defense contracts or for our civilian needs.

Today, there are literally thousands of operations being performed throughout industry which can be speeded up, improved in quality and lowered in cost by the use of available models of special machine tools. The modern tracer-controlled Pantograph machine is such a tool. It is both a special purpose machine, ideal for short runs, and it is an accurate single purpose machine which turns out identical parts or pieces to meet tight production schedules.

The tracer-controlled Pantograph machine is used for inside and outside profiling, routing, die sinking, mold cutting, counterboring, contour milling, chamfering, grooving, graduating and engraving in ferrous and non-ferrous metals, as well as in plastics.

This machine performs on flat, uniformly curved, cylindrical, spherical or

irregular shapes — it works in either 2 or 3 dimensions, in all directions on a horizontal plane, and vertically. It employs enlarged masters, templates or patterns which are quickly and easily made and operates normally at a reduction ratio thereby increasing accuracy — exclusively characteristic of the pantograph.

Single or repetitive accuracy — from one piece to thousands — manual or full automatic operation depending upon quantities — work sizes from the size of a dime to as large as 10 feet.

A new booklet, "Pantography," explains the process and shows what this type of machine can do for you. It is yours without obligation. Write for it today. If interested, also ask for our latest General Catalog 1655. Address the George Gorton Machine Co., 1701 Racine St., Racine, Wisconsin, U. S. A.





**EXTRA** *Inventory*

**EXTRA** *men*

**EXTRA** *service*

*at no extra cost...*

## YOUR **B-RIGHT-ON**

### SOCKET SCREW DEALER

Sure, you expect delivery and service from your industrial distributor, but you will find there's something EXTRA about the service from your Brighton Socket Screw Distributor—an extra interest in your fastener needs, extra desire and ability to fill those needs.

**EXTRA INVENTORY**—When you need socket screws, he has them or will get them quickly from centrally located factory stocks.

**EXTRA SERVICE**—When you need technical help on fasteners, he has at his disposal factory engineers, Brighton's field men, to help you.

**EXTRA QUALITY**—His line of Brighton Socket Screws is tops in quality, meeting the highest standards of strength, accuracy and uniformity.

Take advantage of all the EXTRAS your Brighton distributor offers. If you are not already acquainted, write for his name.



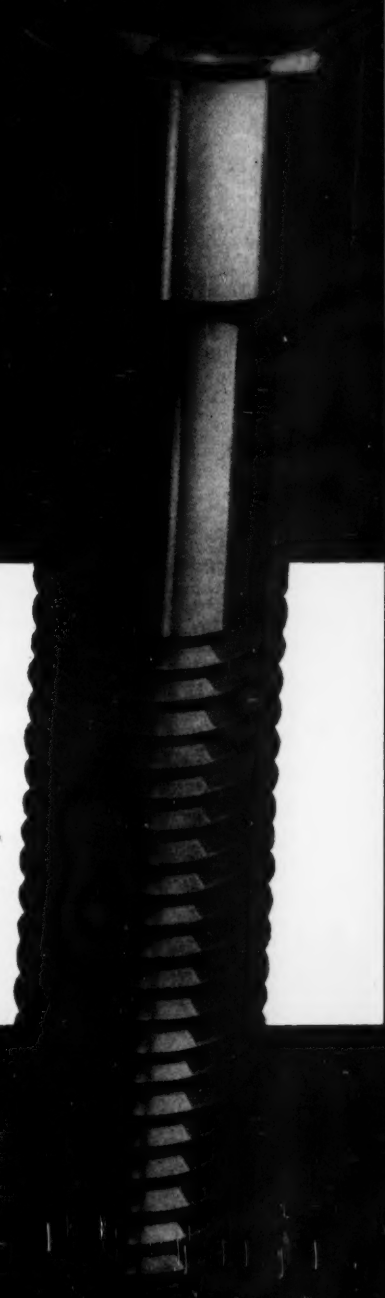
## B-RIGHT-ON

**THE BRIGHTON SCREW & MANUFACTURING COMPANY**

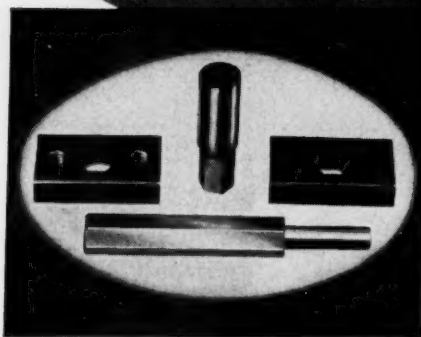
READING ROAD AT DORCHESTER

•

CINCINNATI, OHIO

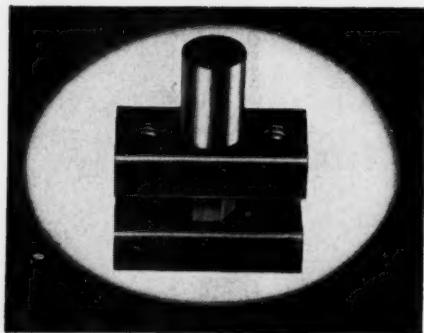


# Can You Make This Punch, Die and Stripper Plate Out of Tungsten Carbide for



# \$35<sup>50</sup>\*

## In Your Plant

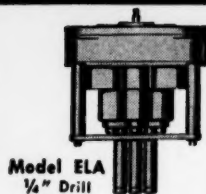


* Electrode manufacturing time	2 hours
Cutting time on die	½ hour
Cutting time on stripper	½ hour
Cutting time on punch	½ hour
Accumulated setup time	1 hour
<b>TOTAL LABOR TIME:</b>	<b>4½ Hours</b>
Cost of Tungsten Carbide material:	\$22.00

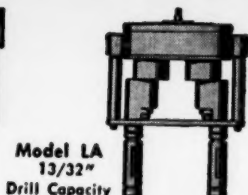
**elox** ◀ we will show you how  
*corporation of michigan*

739 N. ROCHESTER RD. • CLAWSON, MICHIGAN

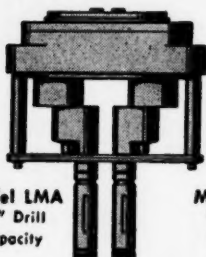
# HEADS to Solve Your Drilling, Tapping, Boring Problems



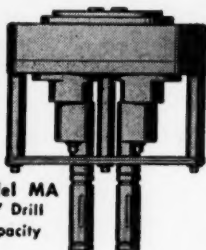
**Model ELA**  
1/4" Drill  
Capacity



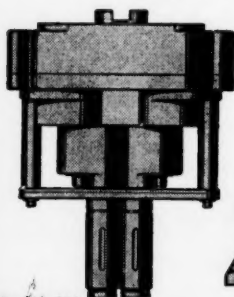
**Model LA**  
13/32"  
Drill Capacity



**Model LMA**  
3/8" Drill  
Capacity

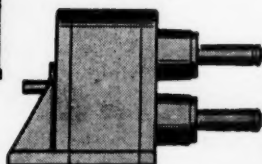


**Model MA**  
3/4" Drill  
Capacity



**Model HA**  
1 1/2" Drill Capacity

**Fixed Spindle Models**  
Size and Capacity  
as specified



## **WISCONSIN Adjustable Spindle**

Drill Heads completely gear driven... are available in 5 Standard Models, with 2 to 8 spindles and Drill Capacities from 1/4" to 1 1/4" ... permit adjustment to any hole pattern. Adjustable Heads with 9 or more spindles are built-to-order.

## **WISCONSIN Adjustable Spindle**

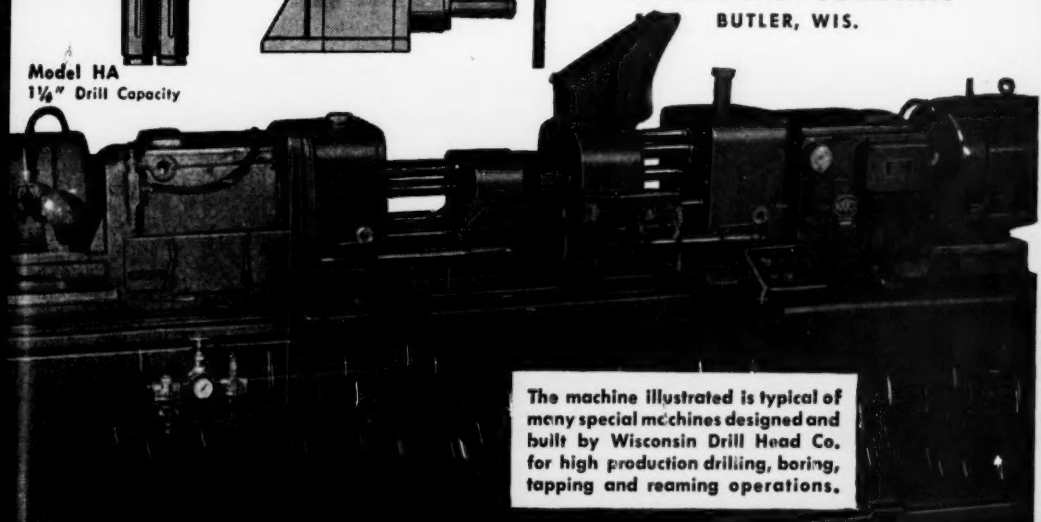
Drill Heads... have Two-Piece Positioning Templates for Fast, Accurate Set-ups that stay put.

## **WISCONSIN Fixed Spindle**

Drill Heads are built to special order in any size or capacity specified for Drilling, Tapping, Reaming and Boring.

Look to Wisconsin for Drill Heads to solve Your Problems.

**WISCONSIN**  
**DRILL HEAD COMPANY**  
BUTLER, WIS.



The machine illustrated is typical of many special machines designed and built by Wisconsin Drill Head Co. for high production drilling, boring, tapping and reaming operations.

# CINCINNATI SHAPERS

...serve over  
**2,000,000 square feet**  
**of manufacturing facilities!**

In this large plant of the Scovill Manufacturing Company this battery of Cincinnati Shapers economically does a wide range of precision work on many materials, including alloys of all metals from cast iron to high acid resistant tool steel.

Tools and new machinery are produced in this department, which also does maintenance work for the entire plant. The Cincinnati Electro Magnetic Clutch and Brake also contribute to speed here, where accuracy and versatile performance are necessary.



**THE CINCINNATI SHAPER CO.**

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



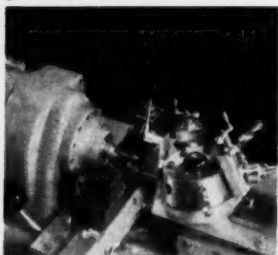
*Photo courtesy Scovill Manufacturing Company, Waterbury, Connecticut.*

**Write for New Cincinnati Shaper catalog No. 6. Comprehensive and up-to-date, covering the complete line of these modern Shapers.**

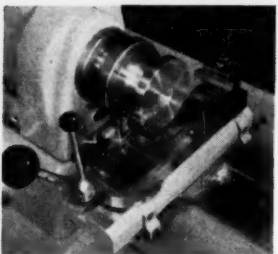
**HARDINGE**  
ELMIRA, N.Y.

## HIGH SPEED PRECISION SECOND OPERATION MACHINES

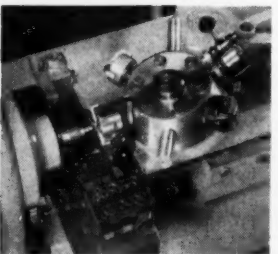
*Produce More Parts at Lower Cost*



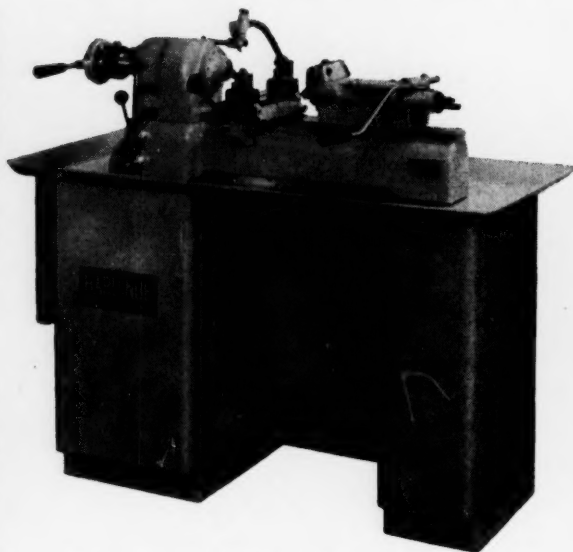
**Collet Chucking**—The right machine for collet work of one inch or less in diameter.



**Step Chuck Work**—For rapid and accurate holding of tubing, casting, moldings, stampings, and machined parts. Capacity to 6".



**Bar Work**—Equipped with bar feed, machine is readily converted to high speed bar work.



Correct size of machine in relation to work saves loss from under-capacity production on larger turret lathes. High spindle speeds to 4000 r.p.m. permit full capacity cutting and excellent finish. Sustained accuracy and ease of operation assure precision results.

You need this machine for rapid, accurate production of parts. Save time and money through the use of Hardinge Precision Second Operation Machines in your plant.

Send for free Illustrated  
Bulletin DSM 59.



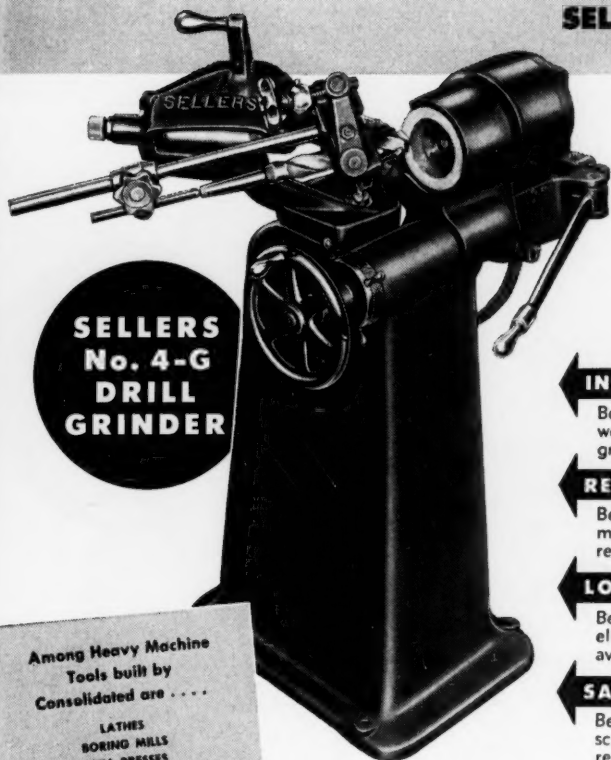
**HARDINGE BROTHERS, INC., Elmira, N. Y.**



# Want better drill performance?

Then try grinding your drills on the grinders  
used and recommended by leading  
drill manufacturers.....

## SELLERS DRILL GRINDERS



### SELLERS No. 4-G DRILL GRINDER

Among Heavy Machine  
Tools built by  
Consolidated are . . . .

LATHES  
BORING MILLS  
DRILL PRESSES  
MILLING MACHINES  
BORING MACHINES  
COLD SAW MACHINES  
BORING, DRILLING AND  
MILLING MACHINES  
DRILL AND TOOL  
GRINDERS  
PLANERS  
SLOTTERS  
RAILROAD SHOP TOOLS  
AUTOMOTIVE TOOLS  
AND OTHER  
SPECIAL MACHINES

#### INCREASE PRODUCTION

Because Sellers correctly ground drills can be safely run at maximum speeds, they increase machine output.

#### LENGTHEN DRILL LIFE

Because with Sellers grinding, angles and clearances are correct, drill lips cut equally and efficiently, wear is minimized, less stock is removed when grinding, doubling drill life.

#### INCREASE HOLES PER GRIND

Because Sellers correct grinding reduces wear, drills remain sharp longer, require less grinding.

#### REDUCE OVERHEAD AND LABOR

Because Sellers precision grinding increases machine production, drilling costs are reduced.

#### LOWER ASSEMBLY COSTS

Because under- and over-size holes can be eliminated, reaming or bushing correction is avoidable, saving time and labor.

#### SALVAGE DAMAGED DRILLS

Because burned and broken drills ordinarily scrapped can be satisfactorily reclaimed and returned to profitable service.

A self-contained dry grinder, the Sellers No. 4-G has a proved record of top efficiency for grinding right hand and flat twist drills, 2, 3 and 4 lip up to 2" diameter. It has an actual maximum capacity for 2 and 4 lip drills up to 3" diameter and 3 lip up to 2 1/8" diameter. Lips are ground to equal length, angle and clearance. Clearance as produced by the Sellers Method, automatically determined by the machine for different size drills, is sufficient to insure free cutting without weakening the cutting edges. Part replacement is negligible but, if ever required, replacement parts are always available. Complete information will be furnished upon request.

**BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848**

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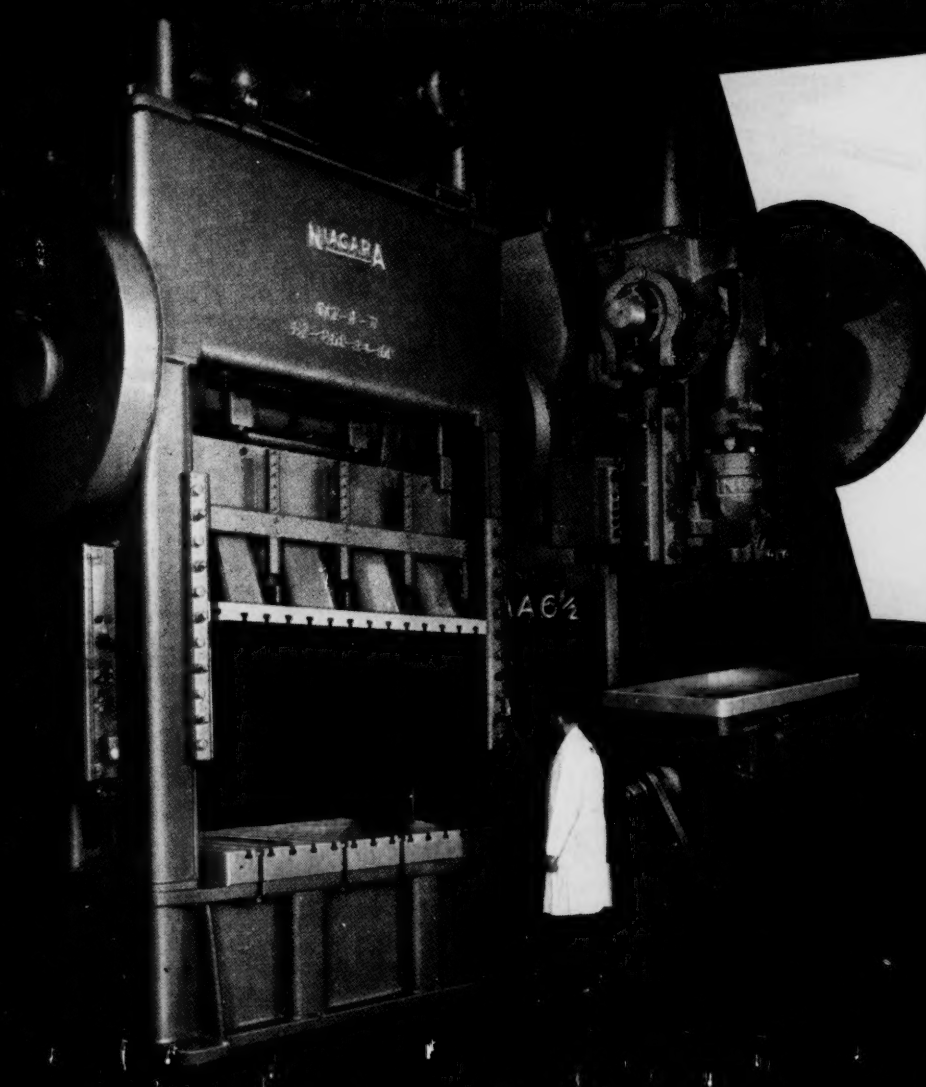


# CONSOLIDATED MACHINE TOOL CORPORATION

SUBSIDIARY OF FARREL-BIRMINGHAM COMPANY, INCORPORATED

ROCHESTER, NEW YORK

# NIAGARA



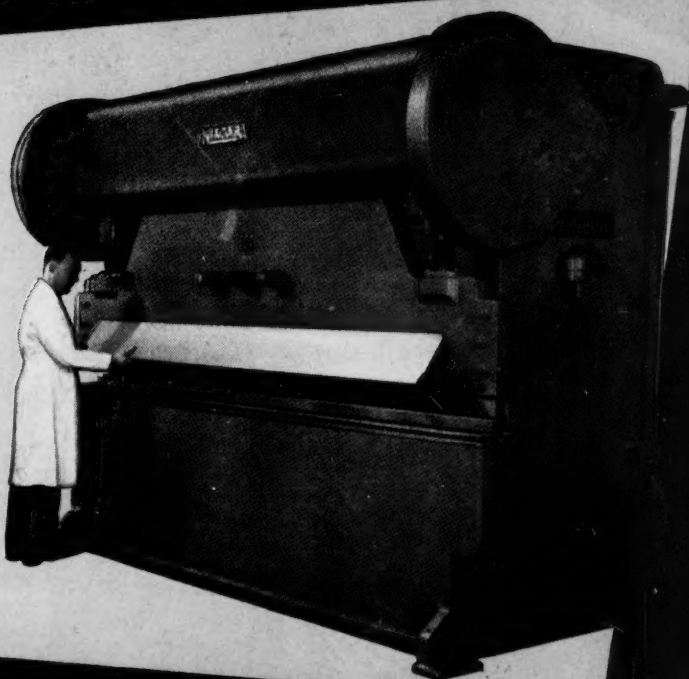
NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

# AMERICA'S MOST COMPLETE LINE OF Presses, Shears, Brakes and other Machines and Tools for Sheet Metal Work

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your sheet metal  
problems to  
NIAGARA  
for unbiased  
recommendations  
on the most  
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You can depend  
on NIAGARA  
QUALITY

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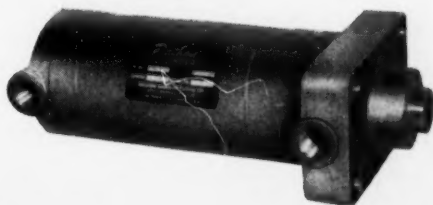
## For the "Super" Finishing Touch . . .

. . . **Brown & Sharpe Surface Grinding Machines.** Exceptional finishes with quick spark-out are assured by rigid construction of these top producers. Their extreme ease of operation and reliable performance have earned the respect of metalworkers everywhere. They set up quickly and adapt readily to the job at hand . . . all controls are within easy reach. For maximum versatility and excellence of finish, investigate both sizes of these surface grinders. Write to Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

***Brown & Sharpe*** 

**A**ll Pathon Hydraulic Cylinders Series RH 2000 P.S.I. or QH 1000 P.S.I. are designed to provide maximum strength and fatigue life in a minimum of mounting space. The use of a single screw thread to attach the head to the body of the cylinder assures smallness in physical size and at the same time gives low stress concentration throughout the barrel to head attaching area with a resultant *plus factor* for shock loading. *Your* Pathon Hydraulic Cylinders are more compact, stronger and yet require less maintenance.

## *Pathon* HYDRAULIC CYLINDERS

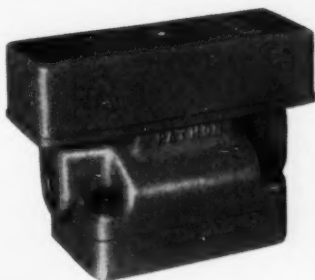


*You get*

**EXTREME COMPACTNESS  
EXCEPTIONAL PERFORMANCE**

**A** MAXIMUM of operational efficiency in minimum space is characteristic of Pathon Series H4W Hydraulic remotely operated directional control valves. They are easy to install, convenient and inexpensive to use, and require an absolute minimum of maintenance attention. Write us today for your Pathon Oil Hydraulic Cylinder and Valve Bulletin No. 22.

## *Pathon* HYDRAULIC VALVES



***Pathon* MANUFACTURING CO.**

3823 Pacific Avenue

Cincinnati 12, Ohio

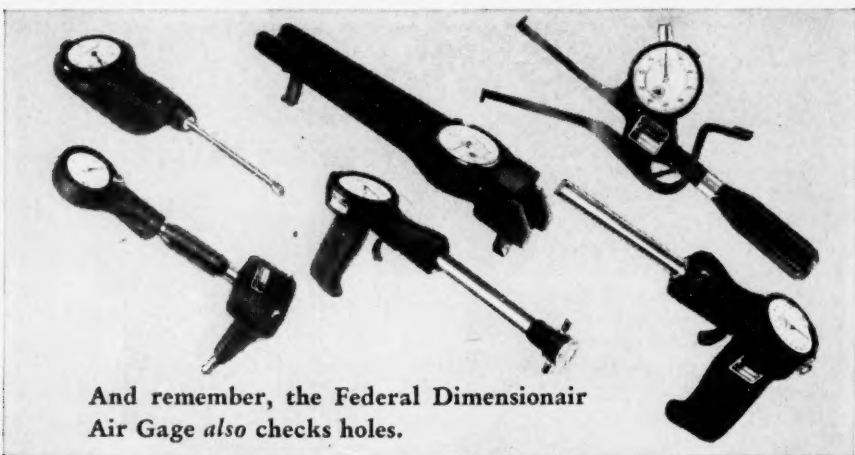


*Whatever the Hole  
Condition . . .*

**...there's a Federal  
Indicator Gage to Check It!**

Whether a hole is deep or shallow, narrow or wide, whether it's difficult to get at, recessed or irregular, there's a Federal Indicating Gage to check it conveniently, and to precisely the dimension limits you require. With a Federal Gage you can inspect a hole as small as .122" and as large as — well, you tell us how big!

Each of the gages below is built to fit certain gaging limitations better than any other gage. Find how useful they can be to you by writing for information on a hole gage to do your special job. Federal Products Corporation, 1141 Eddy Street, Providence 1, R. I.

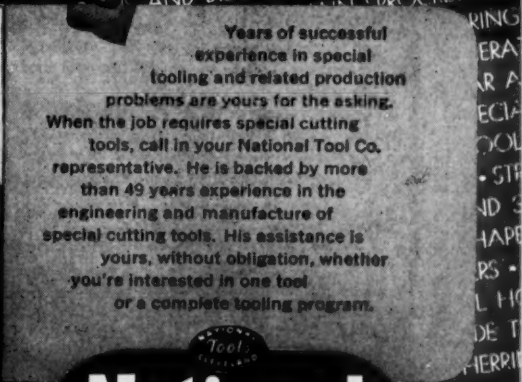


**And remember, the Federal Dimensionair  
Air Gage *also* checks holes.**



Largest manufacturer devoted exclusively  
to designing and manufacturing all types  
of DIMENSIONAL INDICATING GAGES





# National

TOOL CO.

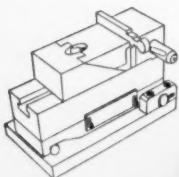
**Cleveland 2, Ohio**

Cleveland 2, Ohio

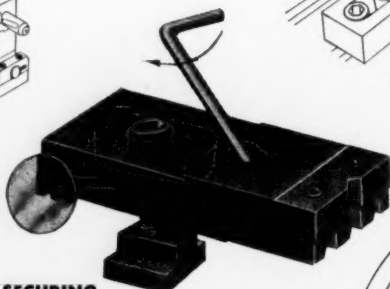
## Eliminate U-Clamps, Straps and Fingers **J & S *All-Purpose* JAW CLAMPS**

secure work-pieces quickly and rigidly  
easily adapted to box fixtures

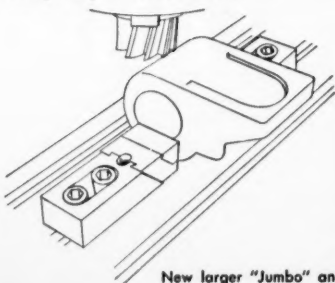
J & S Double Half  
Vise, for use on jig  
borers, millers, plan-  
ers and shapers.



Precision Grinding Vise  
with or without sine bar  
allows rapid unloading  
and exact relocating.



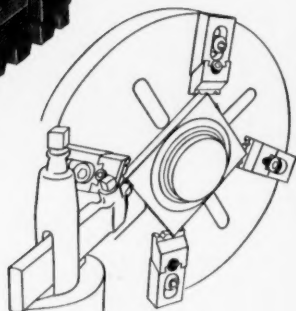
New larger "Jumbo" and  
"Lil-Giant" clamps for use  
on larger-type planers.



### NEW METHOD OF SECURING WORK-PIECES TO MACHINE TOOLS

for Lathes, Planers, Milling Machines, Boring  
Millers, Jig Borers, etc. (9 different types  
including new Counter Clamp)

1. **Faster Set-up:** One adjusting screw provides a 5-ton force to position and hold the work-piece.
2. **Stronger Grip:** The inward and downward movement of the jaw clamp at a 45° angle gives a single, powerful clamping action — easily applied and controlled.
3. **Less Obstruction:** You can pass over the whole clamp 1" from the working surface of the machine face. No interference with reading or measuring tools.



Typical lathe application.  
Standard clamp in use.

**J & S TOOL CO., INC.**  
645 W. Mt. Pleasant Ave., Livingston, N. J.  
(N. J. Highway Route No 10)



New home of J & S Tool Co., Inc.

**J & S  
TOOL CO. INC.**

#### DELIVERY FROM STOCK

WRITE FOR NEW FOLDER!

contains complete details on advantages,  
applications, types and sizes available.  
Booklet describing J & S "Hudmaton"  
Wheel Dressers, etc., also sent on request.

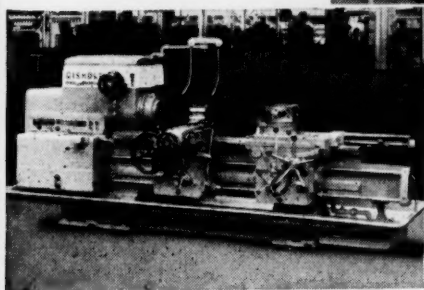
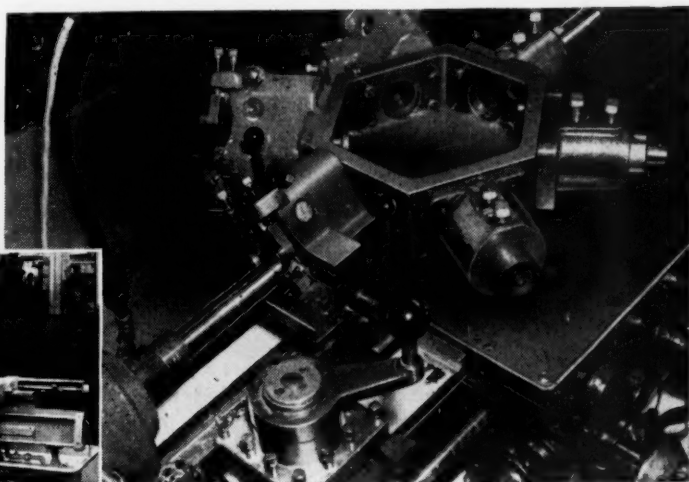
**J & S**



*take shaft jobs  
Like This:*

**they take less time on  
GISHOLT TURRET LATHES**

*Yes, even in lots as small as  
5 or 10 parts, you can't beat  
turret lathes on this kind  
of work. Parts are machined  
complete in 2 operations—  
total time is less than 4 min.*



**no extra equipment needed!**

With no more than your standard bar equipment, you're all set to cut machining costs on shafts like these. No previous operations . . . such as cutting to length or centering . . . are necessary. And with *two or more tools* from turret and side carriage, you have the basic advantage of turret lathe economy—the time saving that means lower costs.

Before you turn to extra equipment or special attachments, look into the possibilities of doing the job the quick and easy way on Gisholt Turret Lathes. Gisholt engineers will gladly help you.



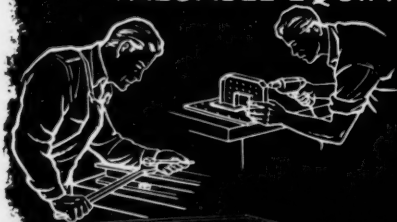
THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



**TURRET LATHES . AUTOMATIC LATHES  
SUPERFINISHERS . BALANCERS  
SPECIAL MACHINES**

**GISHOLT MACHINE COMPANY**  
MADISON 10, WISCONSIN

VALUABLE EQUIPMENT IN ANY SHOP



## HEAVY DUTY CHALLENGE WORK BENCHES



Challenge Work Bench  
featuring tool box shelf  
and steel drawer  
with lock.



Challenge Work Bench  
with tool box shelf.



Challenge Work Bench  
without shelf or drawer.

Whatever your requirements may be — there is a Challenge work bench to meet your needs. Each has a durable cast-iron top two inches thick — will not warp, shrink, splinter or burn. And every one has leveling screws to insure a perfectly level and accurate surface. Legs are strong and solidly braced.

### A COMPLETE RANGE OF SIZES AND STYLES

Three styles as shown . . . Four sizes: (top dimensions) 28x48 and 28x60 with four legs; 28x72 and 28x84 with six legs. Write for details and prices.

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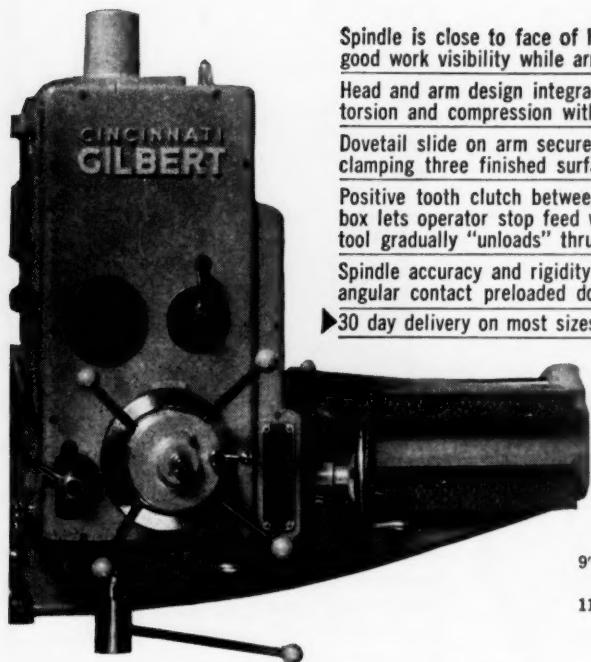
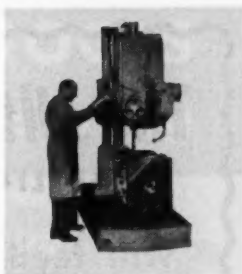


TRADE-MARK ®

THE CHALLENGE MACHINERY COMPANY

Office, Factories and Show Room:  
GRAND HAVEN, MICHIGAN

# MOVES FAST: STAYS PUT



Spindle is close to face of head, provides good work visibility while arm is low.

Head and arm design integrated to withstand torsion and compression with very low deflection.

Dovetail slide on arm secures head by clamping three finished surfaces together.

Positive tooth clutch between feed worm and gear box lets operator stop feed while spindle turns and tool gradually "unloads" thrust normally absorbed by arm.

Spindle accuracy and rigidity insured by four angular contact preloaded double zero ball bearings.

► 30 day delivery on most sizes.

9" columns . . . 3' and 4' arms

11" columns . . . 3', 4', and 5' arms

Fast response to all controls with minimum effort, plus positive "no-drift" clamping, make it easy for Cincinnati Gilbert operators to get more work done accurately and on time. No one detail is responsible: it's the combination of "clean" design and rugged construction that makes Gilbert consistently pay high returns on your investment. 9" and 11" columns. Ask our representative why "those who buy Gilbert buy Gilbert again."

## GILBERT

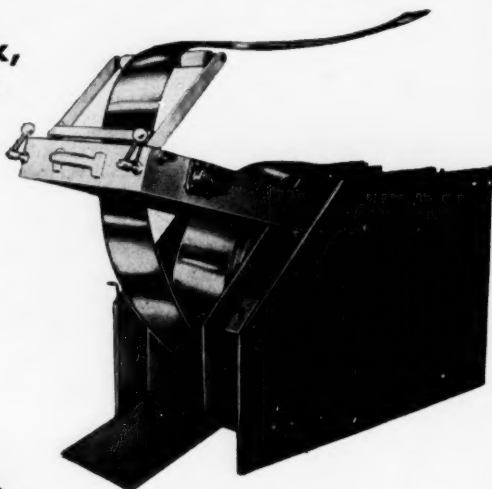
THE CINCINNATI GILBERT MACHINE TOOL COMPANY • 3366 BEEKMAN STREET, CINCINNATI 23, OHIO

# The Ultimate in Coil Cradles

MEDELTON "GRIP FEED" POWERROLL

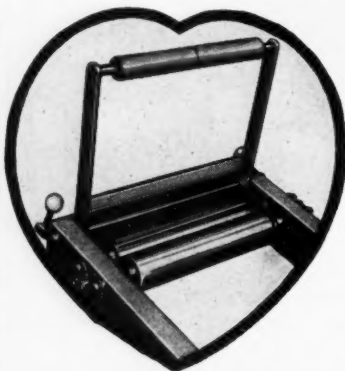
Will feed thick,  
light or heavy  
stock

- No slippage.  
No binding.
- No lifting. Roll it  
on—and go!
- No waste floor  
space—butts  
against press.
- No drag on feed.



## The Heart Of The "GRIP FEED"

These Motor Driven spring loaded pinch rolls uncoil the stock and feed it to your punch press with NO slippage and to the last inch. This positive drive eliminates all binding due to possible telescopic action of coil.



*Write for Brochure, Specifications and Surprising Low Price*

**WM. HALPERN & CO., Inc.**

— MACHINE TOOLS —

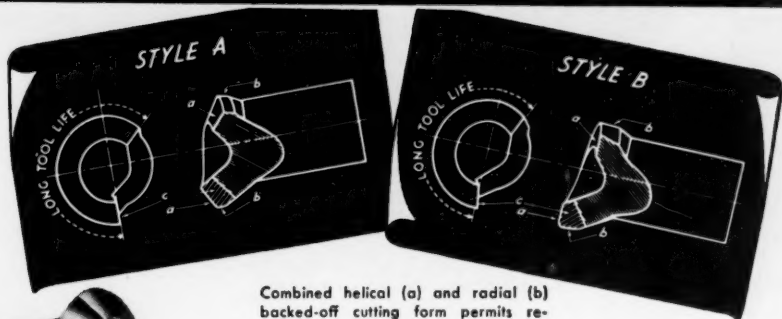
100 Stevens Ave.  
Mount Vernon, N. Y.

245 Connecticut Ave.  
Bridgeport, Conn.



# BOKUM BORING TOOLS

are *Designed* for boring



Combined helical (a) and radial (b) backed-off cutting form permits re-sharpening on only one face (c).



STYLE A  
for general  
boring



STYLE B  
for bottoming  
and facing



STYLE C  
for internal  
threading

**D**esign is based on a mathematical formula which guarantees correct cutting and clearance angles anywhere around the periphery of cutting head—maintained uniformly within limits of  $\pm$  few minutes of  $1^\circ$ .

Bokum tools are available in 3 cutting materials: (1) super high speed steel, Cat. B-1139-6; (2) carbide tipped, Cat. B-398; (3) solid carbide, Cat. B-948.

In range of sizes to bore holes from  $\frac{1}{16}$ " dia. up.

To extend further the already long life of Bokum Tools, we recommend the Resharpener Fixture. Cat. B-AB1 and B-AB412. Tool holders, vertical adjustment and fixed position. Cat. B-483.

*Because Bokum Boring Tools are designed,  
they are uniform and remain uniform*

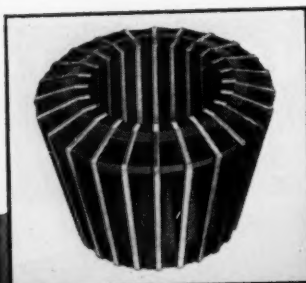


TRADE MARK REG. U. S. PAT. OFF.

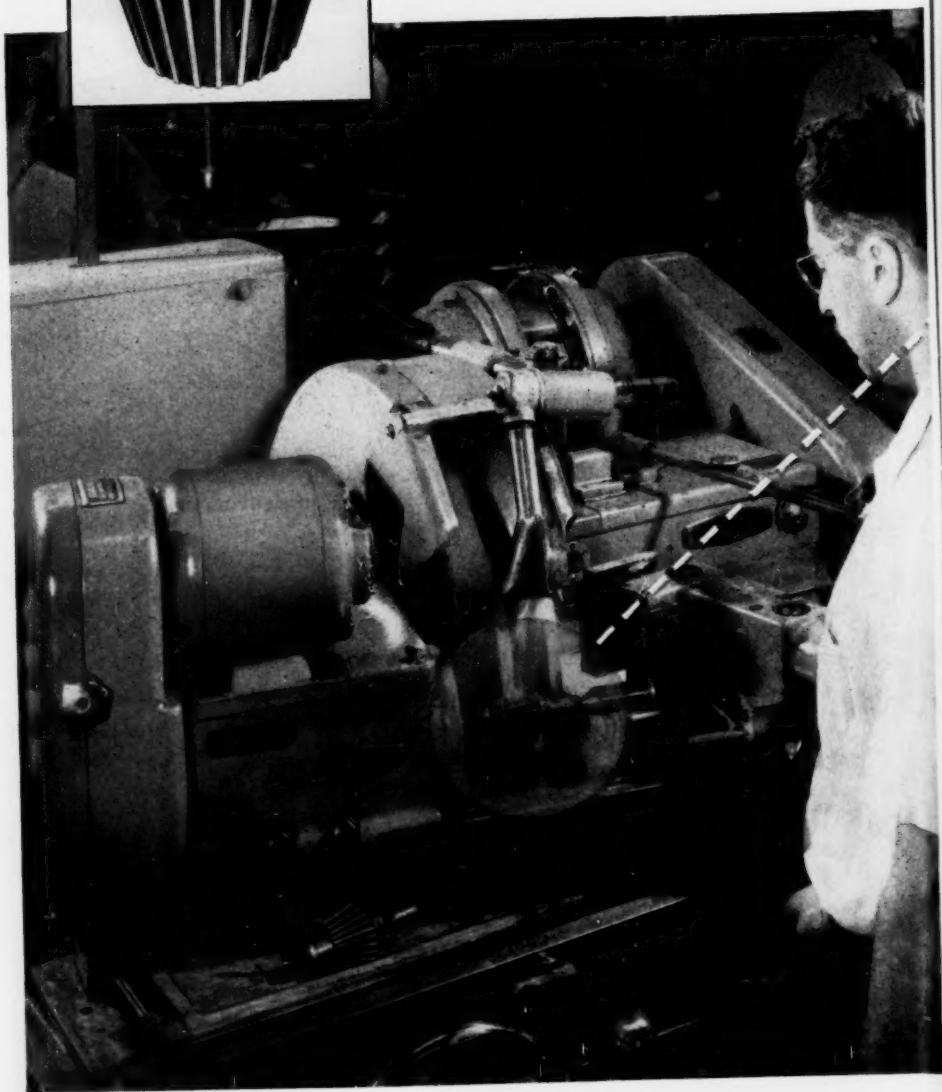
## BOKUM TOOL CO.

14775 WILDEMERE AVE. • DETROIT 21, MICH.

BORING AND INTERNAL THREADING TOOLS, AND TURNING AND FORM TURNING TOOLS  
IN HIGH SPEED STEEL, CARBIDE-TIPPED, SOLID CARBIDE



*Once again! ...  
Jacobs doubles*



# production rate



**Leading chuck manufacturer  
uses Norton machines  
to cut grinding time in half**

When a leader like The Jacobs Manufacturing Company selects equipment, you can be sure that this equipment has had careful study from every angle of performance and cost.

That's why Jacobs' choice of Norton grinding machines is worth serious consideration when you are buying grinding machines.

In producing their famous Rubber-Flex Collets, for example, Jacobs reports that switching from separate operations to a single operation on Norton Type CTU Semiautomatics with multi-wheel mounts has doubled their production rate. *Jacobs reported similar production savings in grinding chuck bodies on the same type of Norton machines.*

Another manufacturer has boosted production from 300 to 600 parts per hour by grinding 2 diameters at once on a Norton machine. Still another reports that a Norton grinding machine with a triple-wheel mount has upped his production rate 128%. Throughout industry, manufacturers are using Norton grinders and lappers to provide

the "Touch of Gold" that means time, work and money saved in grinding operations.

## **The "Touch of Gold" in Your Own Grinding**

means the same profit-increasing advantages. And remember: only Norton offers you such long experience in both grinding wheels and machines to assure this "Touch of Gold" that helps you produce more at lower cost.

For further facts, see your Norton Representative, or write us direct. NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

**To Economize, Modernize with NEW**

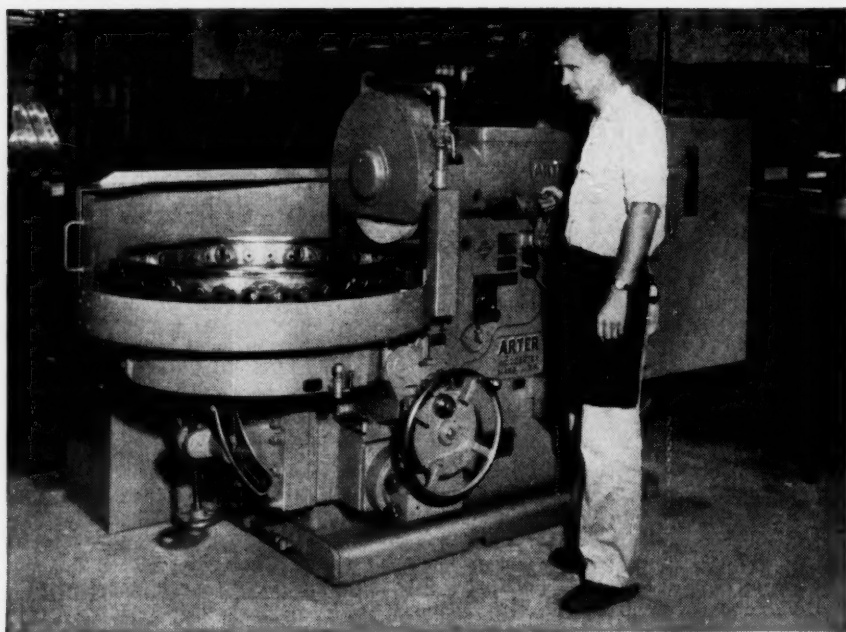


## **GRINDERS and LAPPERS**

*Making better products ... to make other products better*

District Sales Offices: West Hartford • New York  
(Teterboro, N. J.) • Cleveland • Chicago • Detroit

◀ **The "Touch of Gold" at Jacobs.** One of the Norton 6" Type CTU Semiautomatic Grinding Machines used by The Jacobs Manufacturing Company of West Hartford, Connecticut, to grind metal inserts in the famous Rubber-Flex Collets. The basically fast action of this Norton grinder, the multi-wheel mount, special swivel table arrangement and wheel-truing device provide a single setup for traverse and shoulder grinding operations that boosts production rate 100%.



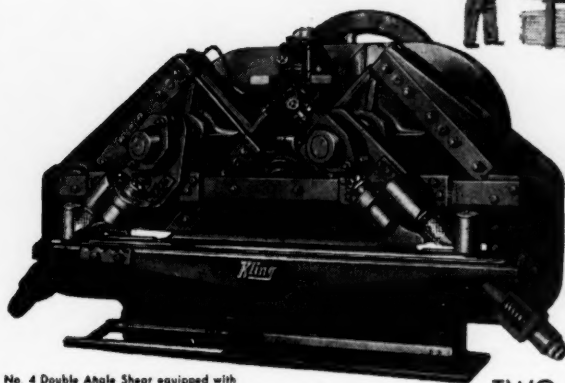
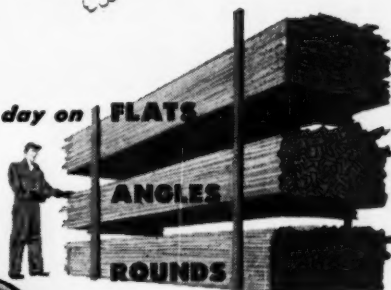
ARTER MODEL B 40" ROTARY SURFACE GRINDER grinding an important part for the latest jet engine. Flat, parallel surfaces are required. ARTER has been building Surface Grinders for work requiring the utmost precision for flatness, size and finish for more than thirty years. ARTER ROTARY SURFACE GRINDERS are made in sizes from 8" to 40" chuck capacity.

*Write today for complete details and specifications*

***Arter* GRINDING MACHINE CO.**  
WORCESTER 5, MASSACHUSETTS  
Rotary Surface Grinders, Cylindrical Grinders, Flat Circular Cutter Grinders,  
Internal Grinders, Carbide Tool Grinders

# It's the **BUSIEST** machine in the shop!

...gives more cuts per day on **FLATS**



No. 4 Double Angle Shear equipped with Automatic Lubrication System, Gear Guards and Automatic Hold-downs.

**Kling**  
**double**  
**angle**  
**shears**

TWO shears in ONE machine!

If you're using obsolete, slow-poke methods of shearing, the Kling Double Angle Shear can help you save time and money. This modern compact machine is designed for high speed, high production shearing on both long and short run jobs. Many metal fabricating plants and steel warehouses have found the Kling Shear to be the workhorse of the shop. For instance, one machine will shear round bars and bar angles on the left side while the right side can be used for structural angles and flat bars. The machine is built with the speed and power to handle the bulk of your shearing requirements. For shops with considerable mitre shearing

work, Kling Double Angle Shears can be mounted on a turntable to facilitate handling. Automatic hold downs and one-shot lubrication can be furnished when desired. Sizes to handle angles up to 8" x 8" x 1 1/2"

#### WANT TO CUT SHEARING COSTS?

Find out how this high-production machine, available in four sizes, can give you more cuts, cleaner cuts on your shearing operations. Write for more information and latest bulletin. Kling Bros. Engineering Works, 1320 North Kostner Avenue, Chicago 51, Illinois.

SEND FOR NEW BULLETIN 2345

5808 MMRRR

Since  
1892

**Kling**

...an investment in speed!



Friction Saws



Combination Shear  
Punch & Copers



Rotary Shears



Punches

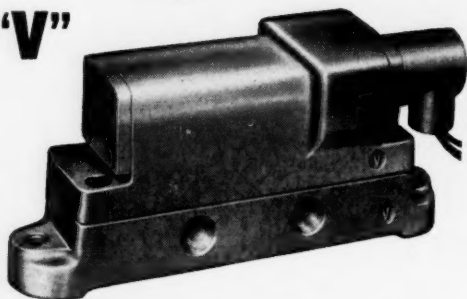


Plate Bending Rolls

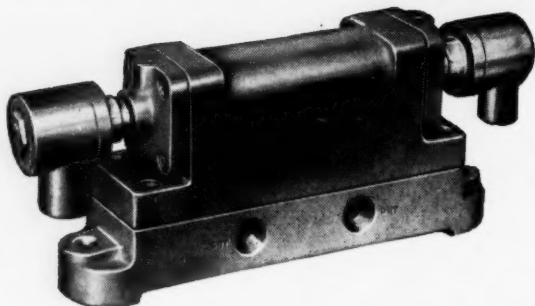
# Widely Adaptable

## NOPAK Model "V"

### 3- and 4-Way PILOT OPERATED SLIDE VALVES



NOPAK Model "V" Type AR,  
4-Way Pilot Operated Slide Valve.  
Unbalanced piston shifted by  
energizing a normally closed  
2-way solenoid pilot.



NOPAK Model "V" Type R,  
4-Way Pilot Operated Slide Valve.  
Balanced piston is shifted by  
means of normally closed cam,  
hand, foot or solenoid bleeder pilots.

Pilot Pressure or Bleeder Operated . . . these unique valves permit an infinite variety of cycling in the direct or remote control of continuous or intermittent cylinder action. They may be energized by means of 2-way hand, cam or foot poppet valves or with solenoid pilot or bleeder valves. Light weight, all-aluminum construction, simple design and small size make them extremely versatile, and adaptable to many uses which other valves cannot fulfill. Operate at air pressures from 20 to 150 psi.

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•  
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Cities

**NOPAK**  
**VALVES AND CYLINDERS**  
DESIGNED for AIR and HYDRAULIC SERVICE



For Every Carbide Drilling Application  
There's a **STANDARD SUPER DRILL**

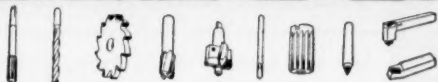


**and really super!**

**Six points of superiority—**

Result of two years' research. Extensive tests indicate it's the most durable and the fastest cutting carbide twist drill developed to date. Feeds as high as 8" per minute in cast iron have been obtained. Stocked in fractional, wire and letter sizes for your convenience.

**NEW LOW PRICES**



**QUALITY CARBIDE TOOLS**

*Super*

**TOOL COMPANY**

21650 Hoover Rd., Detroit 13, Michigan

5210 San Fernando Rd., Los Angeles 3, California

# APEX offers you 3,910 choices in Impact Extension Universal Wrenches!



Standard (illustrated) and tension types; shank lengths to 15".

Hex Drives:	1/4"	5/16"	7/16"	5/8"
for Hex nuts:	1/4" to 5/16"	1/4" to 3/4"	1/4" to 1 1/16"	5/16" to 1 1/4"
for Square nuts:	1/4" to 7/16"		1/4" to 1 1/16"	5/16" to 1 5/16"



Standard and tension (illustrated) types; shank lengths to 15".

Square Drives:	3/8"	1/2"	5/8"
for Hex nuts:	1/4" to 3/4"	1/4" to 1 1/4"	5/16" to 1 1/4"
for Square nuts:	1/4" to 5/8"	1/4" to 1 1/16"	5/16" to 1 5/16"

When *your* nut running operations call for impact extension universal wrenches, choose yours from the 3,910 types and sizes offered by Apex.

**You'll increase productive output**—Apex wrenches eliminate all connections, provide direct drive from tool to work, insuring greater torque. Will not bind or catch, even at 35° maximum operating angle.

**You'll save production time**—Tension type wrenches have sleeve-enclosed spring which holds socket firmly in straight or angular position. Ends awkward hand-positioning of sockets in those hard-to-reach spots.

**You'll have less wear-out and breakage**—Each Apex wrench is precision machined from high carbon electric furnace alloy steel, cold broached and heat treated to withstand severe shocks and strains.

There's an Apex impact extension universal wrench exactly fitted to *your* nut running job—write, on your company letterhead please, for Catalog 29, in which you'll find thousands of Apex impact sockets, extensions and adapters for every nut running operation.

## APEX TOOLS

## extension universal wrenches

THE APEX MACHINE & TOOL COMPANY  
1027 S. Patterson Blvd., Dayton 2, Ohio

Power Bits, Insert Bits and Bit Holders, for Phillips, Frearson (Reed & Prince), Slotted, Clutch Head and Socket Head Screws • Hand Drivers for Phillips, Frearson and Clutch Head Screws • Two-Piece Drivers for Hex Head Screws • Sockets, Extensions, Adapters and Nut Setters • Universal Sockets, Extension Wrenches and Adapters • Self-Releasing and Adjustable Stud Setters • Safety Friction Tapping Chucks • Vertical Float Tapping Chucks.

***If you're  
not sure...***



**ask your tool crib supervisor**

Chances are your tool crib foreman will tell you CP Air Impact Wrenches are asked for the most. And with good reason! The CP-360 for example, is designed for fast, low-cost nut running in production line and maintenance. Its ease of operation reduces operator fatigue — increases worker output. CP Air Impact Wrenches are supplied from  $\frac{1}{4}$  to  $1\frac{3}{4}$  inch bolt size in straight and angle head models with side, pistol grip or straight handles. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*

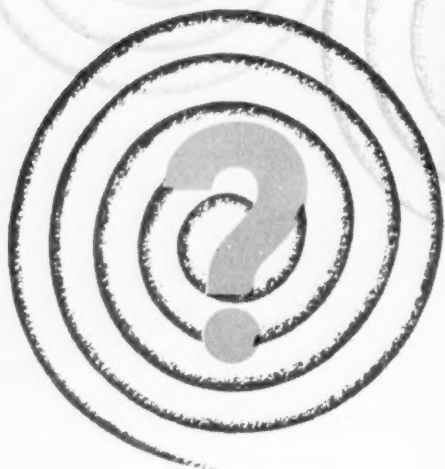


**Chicago Pneumatic**

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES  
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

**Tough  
centerless  
finishing  
problem . . . . .**

**got you  
going  
in  
CIRCLES**



**Here's the  
grinding wheel  
that will  
ABSOLUTELY  
solve it!**

CINCINNATI Grinding Wheels can help you straighten out that tough centerless finishing problem, *because CINCINNATI Wheels are made to team-up with centerless grinders.* And with a Cincinnati Milling-trained machinist on the

spot to help you get the most out of CINCINNATI Grinding Wheels, you can count on the *right answer*—FAST!

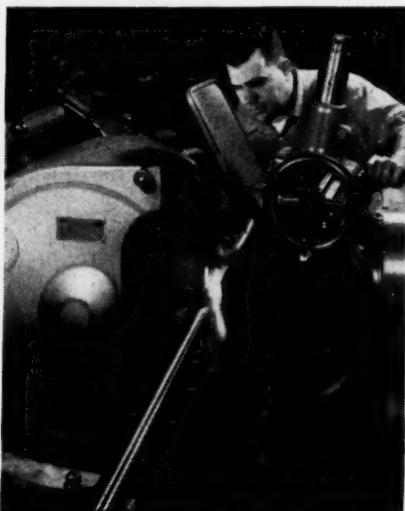
Here's why CINCINNATI Wheels can help you:

**1** CINCINNATI Grinding Wheels are used by—and *developed* by—Cincinnati Milling, which has done more research, had more experience and made more centerless grinders than any other organization in the world.

**2** Using CINCINNATI Wheels, we've solved hundreds of centerless grinding problems—such as production, roundness, taper and sizing.

**CINCINNATI Grinding Wheels** represent 25 years of Cincinnati Milling research and practical experience based on an entirely new approach to grinding wheels—the development of the grinding wheel as a true cutting tool.

We are so confident—so *absolutely sure*—that CINCINNATI Grinding Wheels can help solve your tough centerless finishing problem that we make this *unconditional offer*: either you must be completely satisfied, or we will make no charge for the CINCINNATI Grinding Wheel used.



This problem really had production men in a whirl! Using just one grade of wheel, grind stainless bars and tubes ranging from  $\frac{1}{8}$ " bars to 2" tubes and up to 12' long. For solution, see Case History

**How CINCINNATI GRINDING WHEELS  
Solved Tough Centerless  
Finishing Problem**

**CASE  
HISTORY  
No. 419**

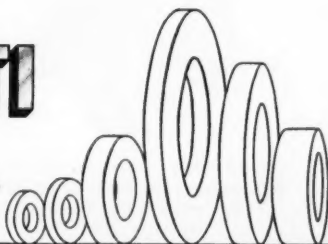
The job	Grind 300 series stainless bars and tubes ranging in size from $\frac{1}{8}$ " bars to 2" tubes and up to 12' long.
The machine	Cincinnati No. 2 Centerless with Type C long bar attachment.
The problem	A single grade of wheel was needed that would handle a wide variety of sizes and types of stainless bars and tubes. Normally, several grades of wheels would be specified, but the quantities involved would make this usual procedure uneconomical.
The solution	Another notable solution to a difficult problem was found through the help of Cincinnati Grinding Wheels machinists, who studied the problem and discussed it with production and machine tool men.  High production and acceptable tolerances, both for size and finish, were achieved by using a Cincinnati Wheel, 60A-10-12, silicon carbide grain, resinoid bond.  However, the Cincinnati experts did more than simply prescribe the correct wheel. They also provided a schedule of feed rates, cut speeds and number of passes for each size and type of bar. All of this was carefully worked out on the spot by Cincinnati men to make the wheel produce at its best in every situation.

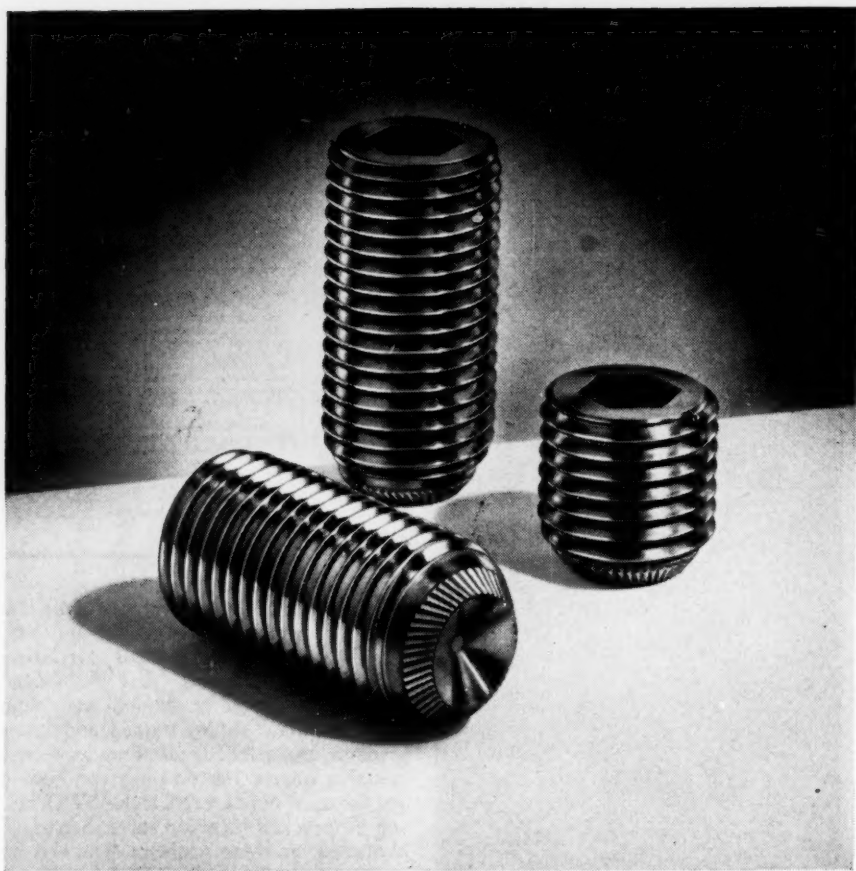
So, start the new year right—with the right answer to tough centerless finishing problems: CINCINNATI Grinding Wheels. Contact us at once. We'll send one of our expert machinists—men who are Cincinnati Milling-trained and know grinding and grinding machines as well as grinding wheels. He can show you how to get the most out of CINCINNATI Grinding Wheels and help you solve that tough centerless finishing problem. There is no charge for his service. Write, wire or phone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

**CINCINNATI**  
*Grinding Wheels*

THE CINCINNATI MILLING MACHINE CO.

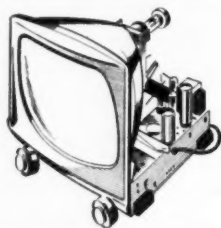
Cincinnati 9, Ohio





UNBRAKO SELF-LOCKING SOCKET SET SCREWS feature the following advantages: knurled cup point that won't work loose; accurate hex socket for nonslip,

positive drive; fully formed threads—Class 3 fit; heat treated alloy steel for strength; standard sizes — #4 to 1" — in a full range of lengths.



USE UNBRAKO.s wherever ordinary cup point set screws are used. On radios, television sets and electronic equipment.



On refrigerators, washing machines, and other household appliances.



## 9 times out of 10 a standard UNBRAKO will do the job

A special socket screw may not be necessary, a standard UNBRAKO usually does the same job—much cheaper. Your local industrial distributor stocks Standards. He gives immediate attention to your requirements, and such extras as special delivery to your plant. Write for UNBRAKO Standards. STANDARD PRESSED STEEL CO., Jenkintown 22, Pa.



SOCKET SCREW DIVISION

**SPS**

JENKINTOWN PENNSYLVANIA



On power mowers, power saws and other power tools.



UNBRAKO Standards—as listed in the SPS Catalog—are stocked by leading industrial distributors everywhere.

*Announcing...*  
*a New addition to our  
 popular line of* **SELECTIVE  
 FEEDING DEVICES**  
**NOW! A FEEDING UNIT FOR ALMOST  
 ANY SPECIFIC APPLICATION!**  
*Also* **EXTENDED  
 ENGINEERING SERVICE—**  
**ENABLING US TO DO THE COMPLETE TOOLING  
 FOR YOUR INDIVIDUAL FEEDING OPERATIONS**  
**New!**

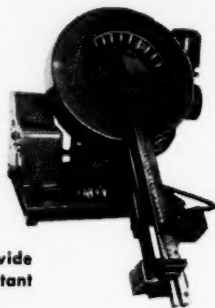


## **DPS BOWL-FEEDER**

A proved method based on the VIBRATORY PRINCIPLE. Provides fully automatic, oriented, single line feeding to Grinding, Packaging, Inspecting and many other automatic machines and operations. Will scientifically feed light, fragile parts that normally could not withstand tumbling.

## **DPS BARREL-FEEDER**

For years our popular unit, successfully used in thousands of plants to help speed production and reduce costs. They were designed with the idea of simplicity in operation and maximum feeding, handling a wide variety of parts. Designed for constant operation.



**• Write Us—**  
 Give Details and learn  
 how our trained engi-  
 neers can supply the an-  
 swer to your feeding re-  
 quirements

**DETROIT POWER SCREWDRIVER CO.**

**2807 W. FORT ST.**

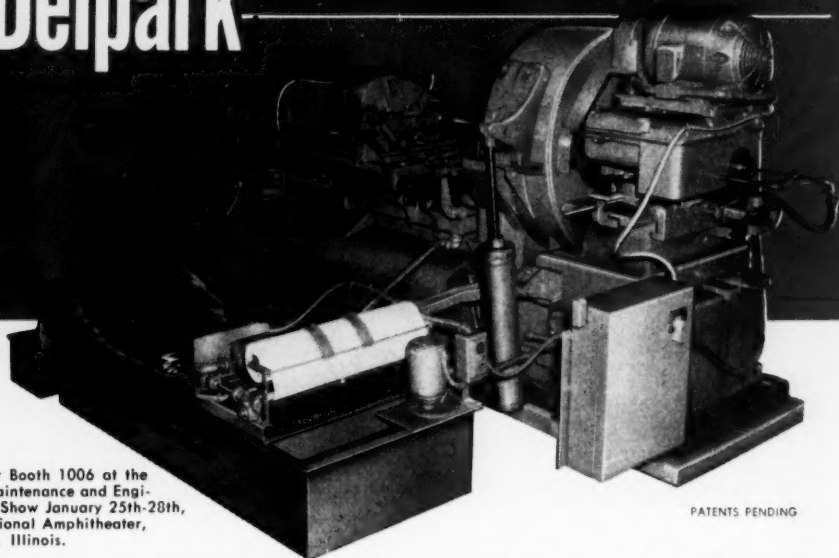
**DETROIT 16, MICH.**

# "Carefree and Inexpensive Operation"

WILLYS MOTORS, INC.

## Delpark

INDUSTRIAL FILTRATION



Visit our Booth 1006 at the Plant Maintenance and Engineering Show January 25th-28th, International Amphitheater, Chicago, Illinois.

PATENTS PENDING

The DELPARK Story runs true to form at Willys Motors, Inc. Here, where a number of DELPARK Filters are in service 16 hours a day, they operate with little attention at a minimum of cost.

Willys Motors says, "We never have to change the coolant, or clean the tank, excepting perhaps on a six month basis, to remove contaminants from floor sweepings. Time spent in cleaning tanks with conventional equipment would many times pay for the filter equipment."

There is one other point to remember: that DELPARK Filters make possible the full capabili-

ties of fine precision grinders which otherwise would be impossible. Greater machine efficiency and fewer rejects add even more to the enormous savings made possible with DELPARK Filters.

DELPARK engineers are ready to help you with your specific problems. Write today for more complete information.

#### INDUSTRIAL FILTRATION COMPANY

13 Industrial Avenue, Lebanon, Indiana

Gentlemen: We would like more information on DELPARK Industrial Filters applied to coolants.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

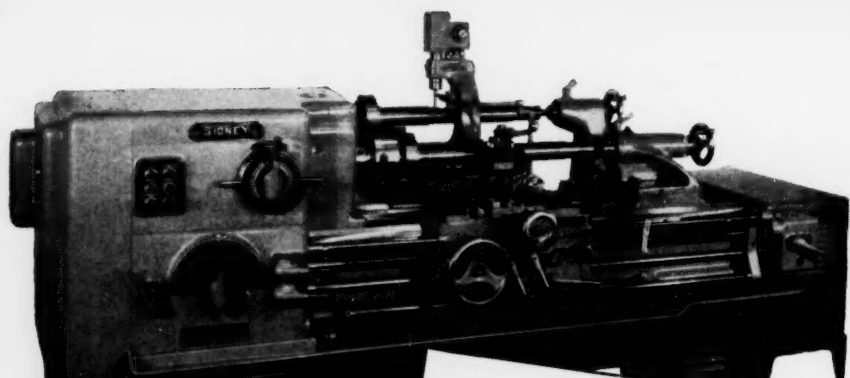
Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## Delpark

INDUSTRIAL  
FILTRATION

Backed by more than 30 years experience in Industrial Filtration  
INDUSTRIAL FILTRATION COMPANY - LEBANON, INDIANA



**DON'T LET  
OBSOLETE EQUIPMENT  
PUT YOU OUT OF  
COMPETITION**

Old-fashioned, out-of-date and outworn equipment has no place in any modern industrial plant . . . and certainly plays havoc with your chances of competing successfully.

## **SIDNEY FLUID TRACER LATHES**

THE "LAST WORD" IN  
**COST-SAVING EFFICIENCY**

You save amazingly on production-time per piece — in large or small quantities. You save on maintenance. Result: your costs are reduced so that you can compete . . . and **GET THE ORDERS!**

The sensitive tracer head transfers

every change in contour from the master piece or template to the cutting tool regardless of size, shape or quantity. Change-over to standard lathe operation or back to tracer requires only a few SECONDS since no addition or removal of extra parts is necessary.

WRITE FOR BULLETINS

**THE SIDNEY MACHINE TOOL CO. • SIDNEY, OHIO**

*Builders of Precision Machinery since 1904*

## DEPT. OF DEFENSE work . . . by *LINDBERG* Induction Heating Units



L. A. Young Spring & Wire Corp., Detroit, Mich., use two 5 KW Lindberg Induction Heating Units for production brazing,

soldering, hardening, annealing, stress relieving, hot forming, forging or shrink fitting requirements.

We can't tell you much about the manufacturing processes at the L. A. Young plant (due to security restrictions) . . . but we can tell you about the many rugged construction features of this equipment . . . features which make it so dependable that the L. A. Young organization selected Lindberg Induction Heating Units for their important Department of Defense work. These points of design and construction will minimize costly breakdowns and aggravating work stoppages:

**Filament voltage regulation transformers** keep tube filament voltages at proper values regardless of line fluctuations. The end result . . . longer tube life.

**Checklites** . . . A system of indicating lamps instantly reveals any abnormal operating conditions . . . simplifies servicing.

**Work coil burn-out protection** . . . An electrical interlock system makes it impossible to turn on power when cooling water is not flowing.

**Long-life industrial tubes** feature shortened internal structure . . . Kovar metal-to-glass Seals . . . heavy walled anodes.

**Sealed tank capacitors** are hermetically sealed against dirt and dust . . . require no servicing or refilling.

Investigate Lindberg Induction Heating Units. Ask for Bulletin 1440.

# LINDBERG



### HIGH FREQUENCY DIVISION

LINDBERG ENGINEERING COMPANY,  
2450 West Hubbard Street, Chicago 12, Illinois



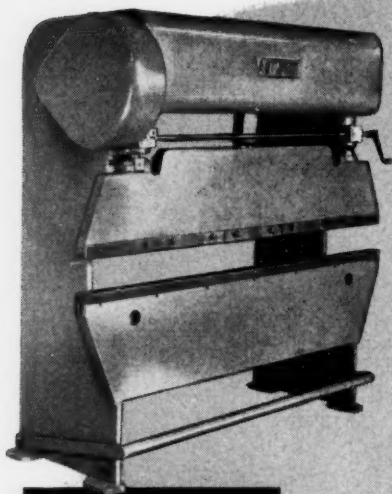
***Now, for the first time...***

**Standard**

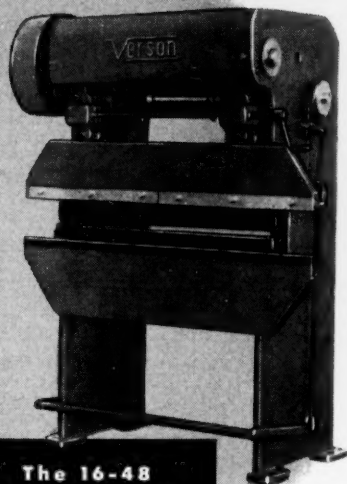
**-Verson-**

**Press Brakes**

**Available from  
Stock!**



**The 1062**  
**25 tons capacity**  
(16 ga. x 78")  
**\$2,190.00 as shown**



**The 16-48**  
**15 tons capacity**  
(16 ga. x 48")  
**\$1,455.00 as shown**

To meet the demand for quality press brakes at modest cost and available for prompt delivery, Verson now offers two standard models *from stock*. For the small shop, it means big press standards of design and construction at prices that will fit almost any budget. For the larger shop, it means an economical answer to handling the smaller jobs without tying up big expensive machines.

Important, too, is the fact that you can order these machines as easily as buying an automobile. There is no involved proposal . . . no long delay awaiting delivery. These standard machines are offered at a standard price and shipped from stock.

Your Verson dealer can give you further information or write direct.



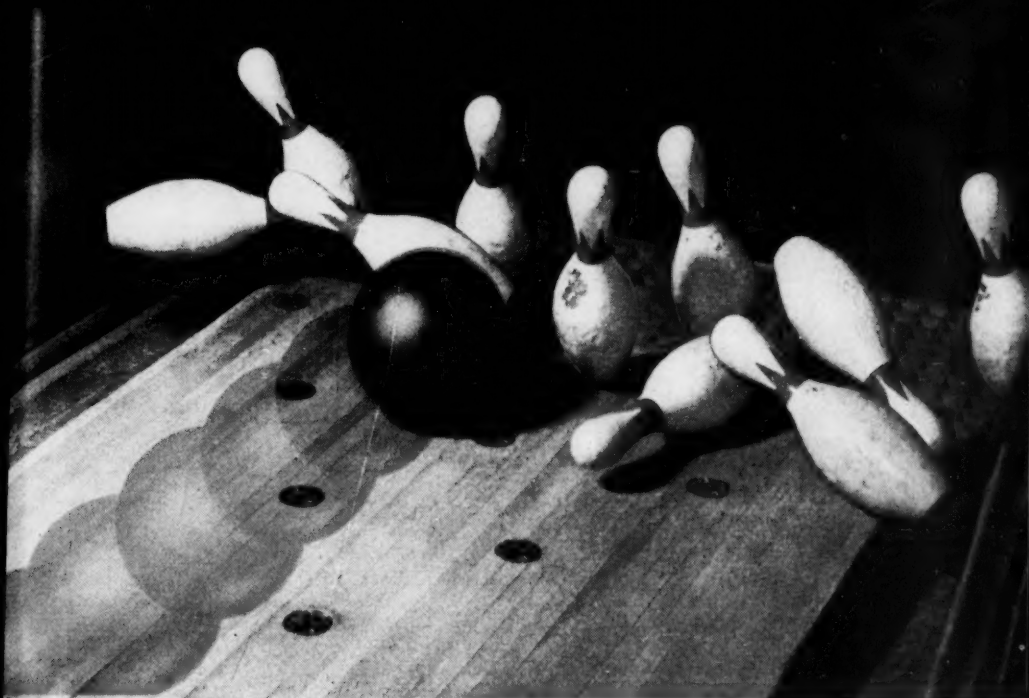
ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

**VERSON ALLSTEEL PRESS CO.**

9310 S. Kenwood Avenue, Chicago 19, Illinois  
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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES  
TOOLING • DIE CUSHIONS • Verson-WHEELON HYDRAULIC PRESSES





## What's the **score** in **your shop?**

You're bound to be way out ahead—with a "ten-strike" in every frame—if your cutting fluid is CIMCOOL®. Because this radically new and different coolant covers 85% of all metal cutting jobs . . . and does a better job.

Naturally Cimcool puts you in the winning column. It's a *chemical emulsion*. Cimcool replaces all water emulsions and all but a few highly compounded specialty oils. It permits faster speeds and increases tool life because it combines friction reduction and cooling capacity in a degree never before attained by old-fashioned coolants. It's longer lasting in machines. So Cimcool reduces downtime and cuts labor costs for cleaning and changing.

Frankly, we're sure that *you'll* be bowled over when you see what Cimcool can do for you. For a demonstration, just write us and we'll have one of our Cincinnati Milling-trained machinists call on you—without cost or obligation. Or, if you prefer, write for our free booklet, "Cimcool Defeats Heat." Address Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

®Trade Mark Reg. U.S. Pat. Off.

# CIMCOOL

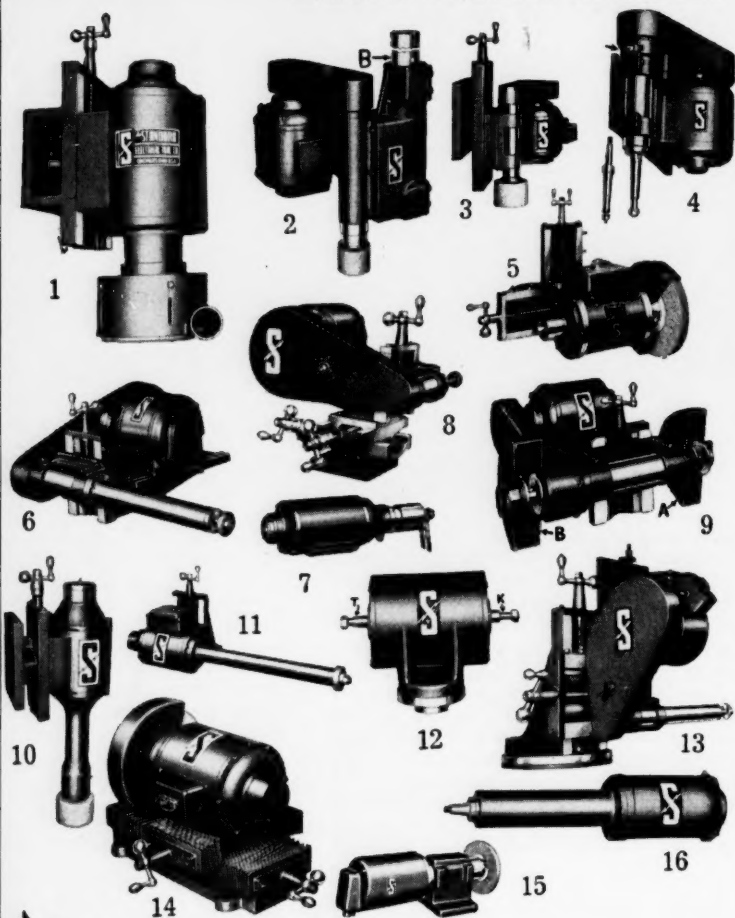
*for 85%*  
*of all metal cutting jobs*

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

# Precision Spindles

with  
endless versatile variations

- MODERNIZE YOUR OLD MACHINE TOOL WITH ONE OF THESE SPINDLES.
- DEVELOP YOUR OWN SPINDLE WITH ANY COMBINATION ILLUSTRATED.
- OUTLINE YOUR PROBLEM—WE WILL DESIGN AND BUILD A SPINDLE FOR YOU.



the **STANDARD** electrical tool co.

2487 RIVER ROAD • CINCINNATI 4, • OHIO

# SPEEDY AIR VISE

**SPEEDS UP**

✓ MILLING

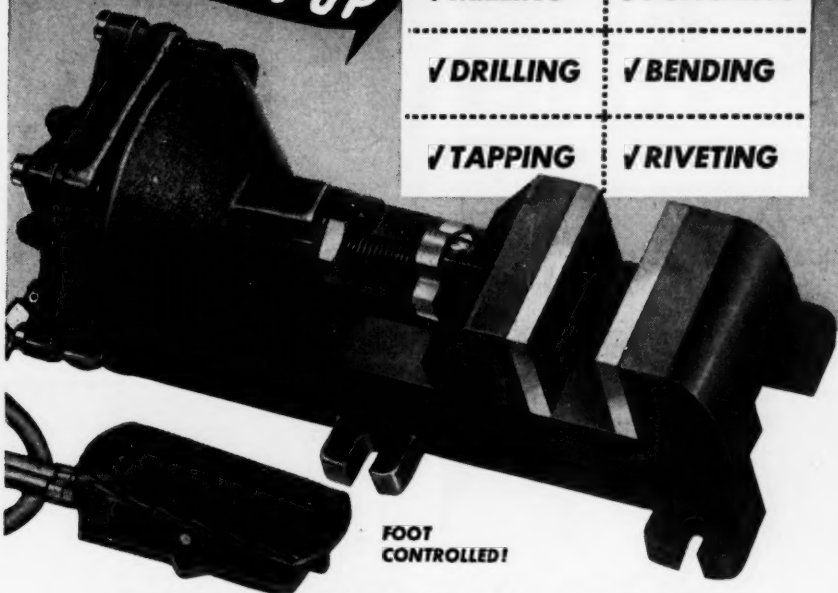
✓ PUNCHING

✓ DRILLING

✓ BENDING

✓ TAPPING

✓ RIVETING



**FOOT  
CONTROLLED!**

## GRIPPING FORCE 15 TIMES AIR LINE PRESSURE

Speedy Air Vise helps you do dozens of operations faster, better, cheaper—by air pressure! Foot control valve opens and shuts vise instantly, leaving *both* hands free to produce *more*! Jaw opens up to 3 inches, holds castings, parts, jigs, etc. Compact, trouble-free, inexpensive.

Complete with Foot Control Valve, Air Hose and Fittings . . . only **\$36.00**

ORDER FROM YOUR MILL SUPPLY DEALER OR WRITE DIRECT

	<p><b>AIR REGULATOR</b> Precision - built. Delivers pressures up to 140 lbs. With gauge, \$5.95. Less gauge, <b>\$3.25</b></p>		<p><b>AIR FILTER</b> Keeps water and particles out of the regulator and pneumatic tools. <b>\$3.00</b></p>	<p><b>BLOW-GUN</b> Looks and operates like a gun. Ideal for cleaning and blowing out chips, dust, filings, scraps, etc. . . <b>\$3.00</b></p>	
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**W. R. BROWN CORP. • 2649 N. NORMANDY AVE. • CHICAGO 35, ILL.**

# CARBOFLEX

TRADE MARK

*depressed center wheels*

**BRAND NEW...FOR FAST, SAFE**

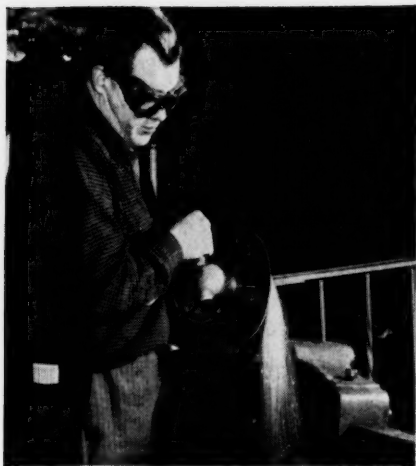


**Reduce rough welds... fast, safely!**



**Remove flash from castings... fast, safely!**

**continually putting more sense in your abrasive dollar...**



**Finish rough edges... fast, safely!**



**Cut off or slot... fast, safely!**

## **ROUGH GRINDING AT LOW COST**

*Roughing? Grinding Welds? Cutting off? Slotting?—here's a great new cost-cutter by CARBORUNDUM to help you do a fast, safe job. CARBOFLEX Depressed Center Wheels are strongly reinforced for complete operator safety, yet give you an extra-high rate of cut.*

*Here are some typical jobs where CARBOFLEX Depressed Center Wheels have proved their superiority: under-cutting and reducing heavy welds, cleaning castings, roughing off fins and sharp edges, notching and cutting off gates and risers, removing surface defects, and general purpose roughing, slotting and cutting off.*

*An exclusive feature of the CARBOFLEX Depressed*

*Center Wheel: the back, as well as the face, is knurled. You can cut with either side plus the edge, without initial dressing.*

*The right combination of tough, top-quality abrasive grain and a strong, reinforced bond is what makes CARBOFLEX Wheels so effective. Tough, durable CARBOFLEX Depressed Center Wheels combine extreme high strength and resistance to cracking with maximum cutting ability... the only combination that gives you more production per wheel at less abrasive cost.*

*Use CARBOFLEX Depressed Center Wheels on your toughest jobs. You'll be more than pleased with the results!*

● **OUR DISTRIBUTOR OR SALESMAN** is ready to demonstrate this new cost-cutter. He's listed in the yellow pages of your telephone directory—under "Abrasives" or "Grinding Wheels." Call him... or, if you prefer, write to:  
The Carborundum Company, Dept. MM 81-41, Niagara Falls, N. Y.

# **CARBORUNDUM**

*Lower cost*  
per piece with  
continuous  
surface broaching  
of small parts

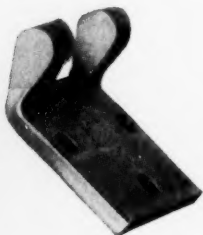


• In many plants where large quantities of duplicate metal parts are being machined substantial savings are being made through the adoption of surface broaching. Production is exceptionally high, close tolerances are maintained, and tool maintenance costs are much lower than with ordinary methods. Foote-Burt engineers, pioneers in this advanced machining method, have had a wide experience in applying surface broaching in many fields.

**THE FOOTE-BURT CO. • Cleveland 8, Ohio**  
Detroit Office: General Motors Building



• Holding fixtures are designed for quick, convenient loading, with automatic clamping and unclamping.



# FOOTBURT

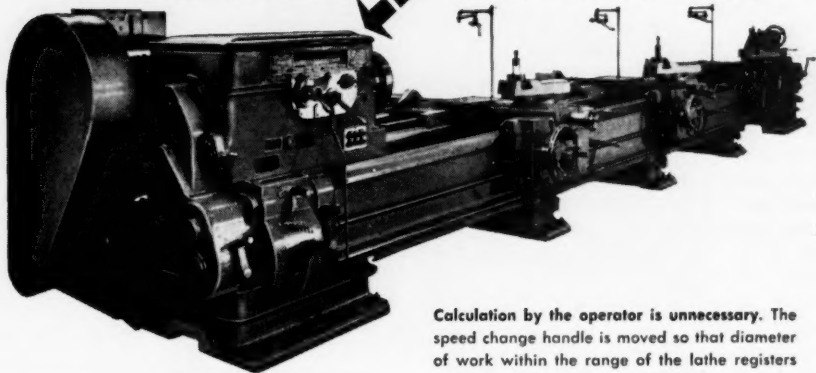
M A C H I N E T O O L S



# THE BIG HYDRATROL STORY:

**16 Spindle Speeds**  
*with only a*  
**Twist of the Wrist...**  
*with This Automatic*

**Slide Rule Selection!**



Just a turn of the hand wheel on the front of the headstock of the LEHMANN Hydratrol Lathe gives you a speed change! An automatic slide rule, co-ordinated with the movement of the handle, shows spindle revolutions per minute and indicates a slide rule calculation of the cutting speeds in feet per minute.

## Check These Other Important Advantages:

- Safe in operation.
- Simplicity in construction and operation.
- Hydraulic friction clutches and hydraulic brakes, self-compensating.
- Automatic safety relay, for harmless and easy engagement of positive clutches when speeds are changed.
- Spindle release for chucking.
- Perfect, safety-control lubrication with filtered oil.
- Gears constantly in mesh.

Calculation by the operator is unnecessary. The speed change handle is moved so that diameter of work within the range of the lathe registers with specified cutting speed in feet per minute, and the lathe automatically makes the necessary change.


The rotary selector gives 16 forward and 8 reverse speeds. No need for intermediate stops; unnecessary to disengage the friction driving clutch to change speed.

*Write today for additional information  
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## over the editor's desk

### Looking Ahead

**T**HE tool and die industry can look forward to this year of 1954 with optimism despite the fact that a buyer's market will exist for the first time since 1940. This optimistic note has been sounded by three leading New York City tool and die manufacturers in a recent panel discussion before the Central Connecticut Tool & Die Industries.

Jack Kleinoder, general manager of John Volkert Metal Stampings, Inc., Queens Village, N. Y., predicted that 1954 will see the average consumer demanding more and better goods for his dollars. "The satisfaction of this demand," he said, "starts with the tool and die industry—the keystone of mass production. Better and more precise tooling produces more parts cheaper.

"In the highly competitive market," he added, "there will be no place for mediocre tooling. Management and facilities must be geared to this better type tooling."

F. W. Wikstrom, of Frank G. Wikstrom & Sons, Inc., Brooklyn, N. Y., said that his own optimistic attitude stems from orders on file at his company which indicate that no one unit of industry, but all industry,

is looking for new types of tooling during 1954 to increase production and reduce costs.

Centre W. Holmberg, of August W. Holmberg & Co., Inc., New York City, a past president of the National Tool & Die Manufacturers Association, emphasized that the tool and die industry must augment its modern equipment to cut material handling costs, produce better engineered tools and more precision work.

### Economic Isolation

**N**O LONGER is any industry, any company or any group within a company immune from effects of economic forces. In the Old Tradition, the boss was supposed to know how to handle every job in the plant. But under conditions today, his sights have been raised and he must understand trends in all parts of the country and in the rest of the world as well. And men in the plant must not only know their jobs but have at least an awareness of these trends which is the reason why many firms now find it necessary to teach economics to foremen and workers. An informed worker will always be a more productive worker.



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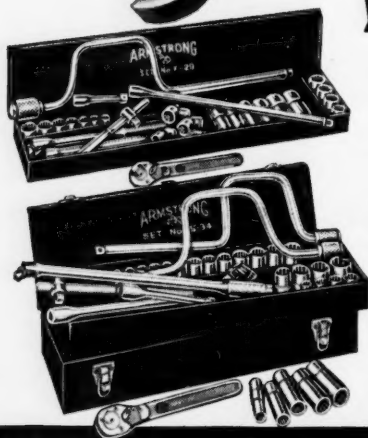


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# MODERN Machine Shop

Vol. 26, No. 8  
JANUARY, 1954

features  
in this issue

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## **Retirees Mix Work with Play**

**By Howard Campbell**

The story of an unusual experiment in dealing with older capable men who possess mechanical skill which has proved highly successful as well as practical in operation. Page 130.

## **Pressure Vessel Fabrication in New Plant**

**By Kenneth L. Walker**

Featured in this article are descriptions of the giant-size tools and pieces of equipment which were recently placed in operation in the new Foster Wheeler Corporation plant for the purpose of building heavy industrial equipment. Page 136.

## **Screw-Type Door and Cover Latches**

**By Fred Rogers**

A detailed, fully illustrated discussion with many helpful suggestions intended to be most helpful to those who are responsible for either designing or manufacturing various types of latches. Page 150.

## **Manufacturing the Merry Tiller**

**By Edward R. Lucas**

This story describes the various operations being performed at the Edmonds, Washington, plant of Merry Manufacturing Company in producing a unique power garden tool. Page 174.

## **Case History No. 11—Machining Stainless Steel**

**By G. J. Stevens**

The author describes a simple method for controlling feed and obtaining longer, more productive use from drills when drilling stainless steel sheets. Page 186.

## **Shearing Machine Guards Increase Efficiency**

**By F. E. Riley**

This article explains how operators may be protected during sheet metal cutting operations by means of a blade guard located at the front and also a mechanical piece-removing device located at the rear of the shearing machine. Page 188.

## **Centralizing Gage for Setting Work to Milling Cutters**

**By W. M. Halliday**

The gage described in this article has been found particularly useful in toolroom work involving the milling of a wide variety of workpieces. Page 196.

# Machined Parts and Their Dimensional Control in Heat Treatment, Part I

By HOWARD BOYER

*Not intended as a discussion of heat treating techniques, this article is primarily concerned with the dimensional changes which are produced in heat treating operations.*

**T**HERE has been good reason for the machinist who took great pride in his work to regard with a look of horror the mere mention of the words "heat treatment." After working so hard to produce another "masterpiece" he immediately had the feeling that all was soon to be

lost in this "necessary evil" process known as the heat treatment. More than one of these craftsmen have no doubt had opinions similar to the machine shop superintendent who defined heat treatment as "a process for covering machined parts with scale and decarburization while simultaneously warping and cracking them so that they were rendered useless."

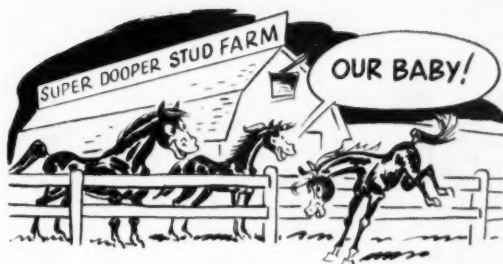
There is little doubt that machinists have had sound reasons for making such radical statements as the foregoing, but heat treating has



"After working so hard to produce another 'masterpiece' he immediately had the feeling that all was soon to be lost in this 'necessary evil' process known as the heat treatment."



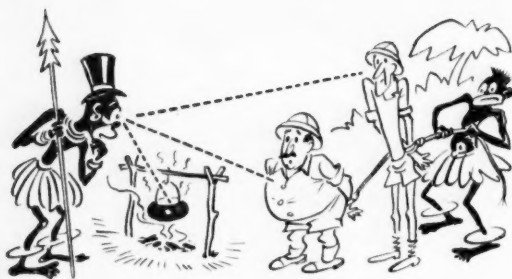
"To achieve the ultimate in minimizing volume change it is necessary to start with extremely careful selection of the steel from which the part is to be made."



undergone drastic changes during the past two decades or more so that such accumulations are no longer fair; or at least there is no good reason for most of these things to happen during the heat treating process. Scale and decarburization are definitely a matter of heat treating equipment and know-how so that this phase is completely in the hands of the heat treater; thus, it does not warrant any discussion in the scope of this treatise since this is not intended as a discussion of heat treating techniques. Likewise cracking is not usually the responsibility of the machine shop. Errors in selection of steels or design of the parts or tools may be important contributing factors, although more often this phase is also mainly in the hands of the heat treater. Therefore, at this point it will be assumed that the machined parts can be treated without cracking and that suitable surface conditions can also be obtained; which leaves the phase with which this treatise will be primarily concerned; that is, the dimensional changes which are produced in heat treating operations. Every day, metallurgists or other technical men in metal fabricating shops are asked the questions: Will this member grow or distort in heat treatment and if so, how much and in what direction? A complete answer to the foregoing complex question would

indeed be one which many would desire the ability to make accurately. Another question which is frequently asked is: Can growth and distortion be prevented? This one can be answered with a somewhat greater degree of accuracy. Due to certain laws of physical metallurgy some volume changes cannot be prevented, such changes usually being in the order of growth. As far as distortion is concerned it is theoretically possible to eliminate completely such conditions in some cases although it is rarely practical to achieve this degree of perfection. It is entirely possible and usually practical to at least minimize deformation in heat treatment and, in most cases, it is possible to hold the amount of actual volume changes to negligible amounts. *To achieve the ultimate in minimizing volume change it is necessary to start with extremely careful selection of the steel from which the part is to be made.*

It must be remembered that the minimizing of either volume change or distortion demands careful planning in several different respects. Many of the factors influencing distortion and volume changes are entirely beyond the control of the heat treater. The selection of steels with



"This is most unfair because the heat treater is faced with certain physical laws over which he has only limited control."

problem, but if there are heat treating operations involved and the work is not finished afterward, the prob-

lelem may pose as a big one if dimensions must be held to extremely close limits.

suitable hardenability values for specific section sizes, design, machining operations prior to heat treatment, and specified metallurgical properties are all important factors which may provide either the potential for relative freedom from change or the tendency to change before the work ever reaches the heat treating shop.

Usually the machine shop personnel feel that the work has been performed satisfactorily if the dimensions are held to prescribed drawing limits prior to heat treatment. As a result of this condition, parts are received in the heat treating shop which cover the entire range of specified limits (or a bit more if the machine shop can get away with it) which leaves the heat treater absolutely nothing for tolerance in instances where the actual dimensions are on the high or low side of the range. *This is most unfair because the heat treater is faced with certain physical laws over which he has only limited control.* This condition is gradually becoming recognized and in many modern plants process engineers establish operational layouts which provide for a portion of the tolerance to be allotted to the heat treating shop. So far this newer practice has been mainly confined to larger plants which employ especially trained process engineers and do their own heat treating as well. No doubt the future will see the practice extended to smaller shops which usually depend upon commercial heat treating establishments for their

The term heat treating tolerance may pose as a new one to most readers and to those associated with metal-working shops, but it is one which is bound to receive more recognition as time goes on. The author and others interested in the study of fabricating and heat treating have been making an attempt to promote the meaning and use of this newer term. Some explanation of this would seem to be in order at this time.

It has always been the custom of design engineers to specify ranges of dimensional limits on drawings. There are no doubt many instances where these limits are specified closer than actually necessary, thus imposing additional difficulty in trying to maintain them during manufacture; but be that as it may there are limits which have to be met. If parts are to be finished all over after heat treatment this will probably offer no

problem, but if there are heat treating operations involved and the work is not finished afterward, the prob-

lem may pose as a big one if dimensions must be held to extremely close limits.

Usually the machine shop personnel feel that the work has been performed satisfactorily if the dimensions are held to prescribed drawing limits prior to heat treatment. As a result of this condition, parts are received in the heat treating shop which cover the entire range of specified limits (or a bit more if the machine shop can get away with it) which leaves the heat treater absolutely nothing for tolerance in instances where the actual dimensions are on the high or low side of the range. *This is most unfair because the heat treater is faced with certain physical laws over which he has only limited control.* This condition is gradually becoming recognized and in many modern plants process engineers establish operational layouts which provide for a portion of the tolerance to be allotted to the heat treating shop. So far this newer practice has been mainly confined to larger plants which employ especially trained process engineers and do their own heat treating as well. No doubt the future will see the practice extended to smaller shops which usually depend upon commercial heat treating establishments for their

work. For example, if a drawing specifies a dimension of plus or minus 0.005 inch and the actual dimensions of the parts prior to heat treatment cover the entire range, there is little hope that all dimensions will be within the allowable tolerance after treatment. Just what portion of the tolerance should be allowed for the heat treater is debatable, but a fifty-fifty division is being practiced in many instances; that is, if the tolerance is plus or minus 0.005 inch the machinist's working dimension becomes plus or minus 0.0025 inch.

One can expect to witness puzzled expressions when initially suggesting such practices, but no one can deny the fairness.

Frequent questions are: What are the causes of dimensional changes and warping in heat treatment? Are the two closely related? How can dimensional change and warping be minimized? Can the amount of dimensional change and the direction of distortion be predicted? Plus other similar questions.

Unfortunately none of the foregoing questions can be answered with a simple statement, even after extensive work by many investigators. *Generally speaking, the dimensional changes and warping encountered in*

*heat treating may be caused by any one of several influencing factors or, to make it all the more complex, more than one of these factors may be influential at the same time.* Thus, the operations are constantly vulnerable to a multiplicity of variables. The results of many investigations have, however, yielded a great deal of data which can, to a limited extent, be employed as working information in spite of all the variables.

An effort will be made in the following discussion to at least partially answer the foregoing questions.

Even though there is, in general, a rather close relationship between dimensional change and distortion, for the most part they shall be discussed separately. Dimensional change is usually in the order of growth, or at least a volumetric expansion, for in some cases one dimension might decrease while another will increase, but usually the net result is an increase in volume. The reason for this condition is that most tools or other parts are heat treated for the purpose of increasing me-

▲

"Generally speaking, the dimensional changes and warping encountered in heat treating may be caused by any one of several influencing factors or, to make it all the more complex, more than one of these factors may be influential at the same time."





"When the steel is again cooled to room temperature the high temperature phase reverts to the original structure or some modification, depending upon the rate at which cooling took place."

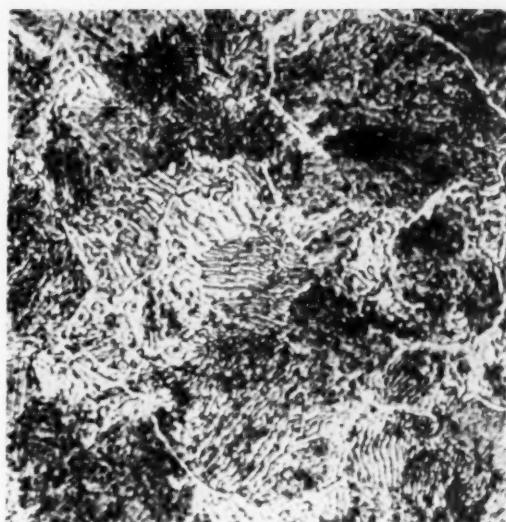
This treatise it not intended as a study in metallography, but a few photomicrographs should assist in the explanation of dimensional change. It must be understood at this time that temporary contraction and expansion caused by temperature changes are not closely related to this condition, only permanent

changes being a part of this discussion. Figures 1 and 2 show microstructures of a one per cent carbon, low alloy steel in the annealed state. Obviously the two structures are radically different even though they are both soft. Figure 1 is a pearlitic structure not usually desirable for this type of steel. Figure 2 is the same composition, but has been subjected to an entirely different cooling cycle from the high temperature phase. The latter is commonly known as a spheroidized structure; termed thus because the carbide is now in the form of tiny spheroids dispersed through the matrix which is essentially iron, as shown in Figure 2. In Figure 1 the carbide has assumed the form of tiny platelets alternated with platelets of the matrix which results in the mother of pearl effect and hence the name, pearlite. Even though these two photomicrographs do appear to be widely different they are both in the annealed state and

chanical properties. In so doing the hardened structures are formed which tend to promote a general increase in volume. It is by virtue of the fact that steels are able to assume more than one crystalline form that they can be hardened by heat treatment. (Steels such as austenitic stainless which will not respond to heat treatment shall not be included in this discussion.)

As heat treatable steels exist at room temperature in the annealed condition they possess one crystalline form, but when they are heated to elevated temperatures (1333 deg. F. and above) the structure is altered to another crystalline form. When the steel is again cooled to room temperature the high temperature phase reverts to the original structure or some modification, depending upon the rate at which cooling took place. These different structures vary appreciably in density so that the volume will vary accordingly.

Fig. 1—Annealed structure of 1.00 per cent carbon steel (pearlitic). Not usually a desirable structure. Magnification, 1000X.



they are about the same in density. Actually some differences have been recorded, but certainly not sufficient in amount to be of any practical importance.

Figure 3 is a photomicrograph of the structure commonly known as austenite, or the form which either of the structures depicted in Figures 1 and 2 will assume when they have been heated to about 1450 deg. F. At this point it must be admitted that we have to assume that they will appear as the structure in Figure 3, for naturally they cannot be studied relative to crystalline

structure at such an elevated temperature. Therefore, as an illustration it is necessary to employ the structure of a steel which will remain austenitic at room temperatures. This particular one is ordinary 18 and 8 stainless, one type which remains austenitic at room temperature.

From studies of other properties it is a certainty that the structure shown in Figure 3 is similar to that which is formed when carbon or low alloy steels are heated into the elevated temperature range. When the alloy is heated so that

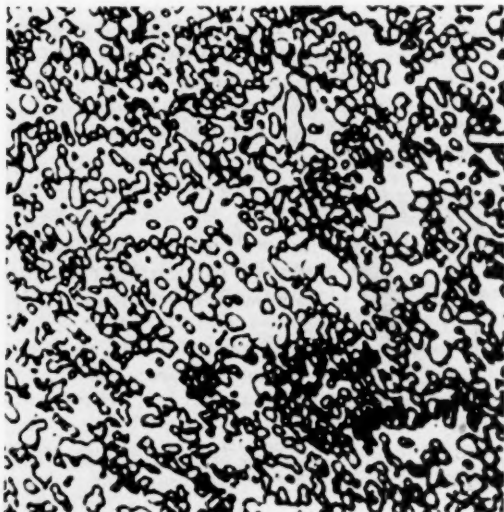


Fig. 2—Annealed structure of same steel shown in Fig. 1 except annealing was performed so as to form spheroidite—generally more desirable. Volumes of the two annealed structures are about the same. Magnification, 1000X.

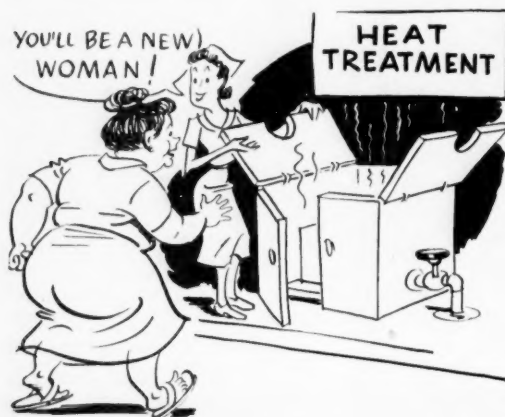


*this new structure is formed many changes take place, one of which is that the mass decreases appreciably in volume.* Such a condition is normal to expect because the carbide particles are taken into solid solution so that the result is a mass of similar crystals, as shown in Figure 3. Therefore, at this point it can be stated that heat treatable steels in the annealed condition possess an intermediate value in respect to volume. This value decreases markedly upon conversion to the high temperature phase or austenite.

After the solid solution has formed with the decrease affected relative to volume, the steel can be cooled slowly in which case either one of the annealed structures or a mixture of the two will be formed. This structural change is accompanied by an increase in volume since the austenitic structure is unstable and starts to decompose except when held at the elevated temperature. The usual purpose in heating such a steel to elevated temperatures is to alter the mechanical properties by

hardening it which can be accomplished by cooling quickly as by quenching in oil. When this is done an entirely new structure is formed which assumes the maximum volume possessed by steel structures. This new structure may be thought of as a modification of the annealed structure because it is in the same phase. This new crystal form is termed as martensite.

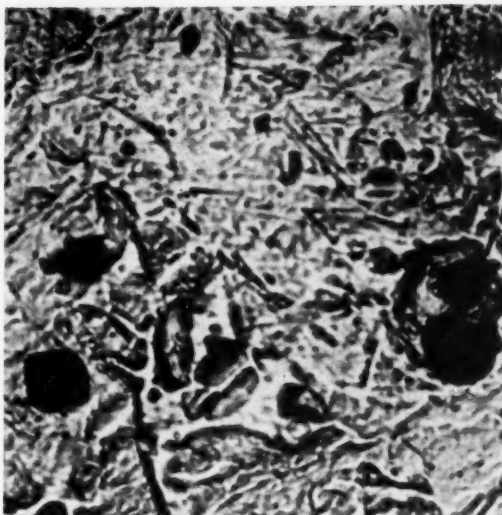
Figure 4 shows a photomicrograph of this same steel after it was cooled quickly and now shows a hardness value of about Rockwell "C" 64. Therefore, the heat treater is faced with this law of physical metallurgy which cannot be denied. From this fact it might be logical to assume that any steel of given carbon content would expand in volume to a known figure since the difference in volume of the various structures is known; thus, calculations of expansion could be accurately pre-established. This would be true if the steel parts involved always formed completely into the distinctly different structures. Unfortunately this is seldom true in every-day practice. These theoretical calculations would hold true only for extremely thin sections. As the section size increases, the all-important factor, hardenability, plays a most influential role and foils such calculations. The



"When the alloy is heated so that this new structure is formed many changes take place, one of which is that the mass decreases appreciably in volume."



Fig. 3—Photomicrograph of austenite, another crystalline structure formed in most steels only at elevated temperatures. This specimen is Type 303 stainless which remains austenitic at room temperature. Large black spots are sulphides. Magnification, 1000X.



term hardenability does not refer to the maximum hardness which the steel is capable of developing, but rather to the capacity or the depth to which this high hardness can be produced. That is, a shallow hardening or low hardenability steel after quenching will develop full hardness only near the surface while the entire center will revert to a form of pearlite which is a low volume constituent.

The term hardenability has become an accepted means of describing and evaluating heat treating characteristics of steels. For example, a one per cent carbon steel containing only minute amounts of alloying elements tends to transform very quickly from the high temperature or austenitic phase, so that extremely rapid cooling is necessary in order to form martensite or the fully hardened structure. The center of any section will naturally be cooled much slower than the surface layers; thus, when a bar of this type of steel in a 1-inch round is quenched from a suitable elevated temperature, the result will probably be a band of very nearly full hardness around the bar, but only about  $\frac{1}{8}$  inch or less in depth. Due to its rapid transformation characteristics, the entire center will fail to harden because of

being cooled too slowly. Therefore, such a steel would be termed as a low hardenability type.

On the other hand a steel of similar carbon content, but containing about one and one half per cent of chromium can be heated and quenched in a similar manner and the results will be widely different. The hardened zone will extend to a much greater depth, in fact almost entirely through a bar 1 inch in diameter. This latter type would be termed as a deeper hardening steel or one which possesses greater hardenability, even though the surface hardness of the two steels would be approximately the same. Since, in the latter type, a much greater percentage of the hardened constituent would be formed, it would be expected that the volume increase would be greater, which is true. When the alloying elements are increased still further in amount the hardenability increases rapidly so that it is easy



Fig. 4—Photomicrograph of martensite in a 1.00 per cent carbon, low alloy steel. Martensite is the hardest and least dense of all steel structures. Magnification, 1000X.

to form the hardened structure completely through heavy sections, even with a much slower cooling rate, due to the wide variation in transformation characteristics of the different alloys.

One would, with this knowledge, readily expect the high alloy steels, such as high carbon stainless and high speed steels, to increase in volume in accordance with the physical laws relative to the known volume increase with the formation of the hardened structure. This would be true, if it were not for the fact that another marked contributing factor enters and complicates the situation. When steels of the type just mentioned are cooled from their high temperature phase there is a marked tendency for a sizable portion of the high temperature phase to remain untransformed which is known as retained austenite. It is not uncommon, in the instance of such high alloy steels, for 30 to 40 per cent of

the total volume to remain untransformed after cooling to room temperature. In such instances the result is that 60 to 70 per cent of the total volume is transformed to martensite, which is the highest volume constituent, while the entire remainder is the lowest volume constituent. Therefore, instead of

a marked increase in volume the net result may be a slight decrease in the volume compared to the same steel in the annealed state. This actually varies slightly from a decrease to a minor amount of increase.

The question might arise, at this time, as to what changes might be expected in the carburizing types. It must be remembered that when steels are case hardened by carburizing a rather wide variety of structures may be formed starting with an extremely high carbon content at the surface and gradually decreasing to the lower carbon content of the original steel, which is the core. There is no doubt of the fact that when any steel is carburized some material is added so that, in general, there will be a dimensional change in the form of an increase irrespective of whether the steel is subsequently hardened.

Hardenability also plays an important role in the performance of

Fig. 5 — Photomicrograph showing both martensite and retained austenite in the case of a carburized alloy steel. Magnification, 1000X.



carburizing steels relative to dimensional changes. That is, a straight carbon steel such as the well known C-1020 may be carburized and hardened to a high degree of surface hardness. The carburized portions will tend to expand to some degree as the hardened structure is formed: although C-1020 is a low hardenability steel, the core portion will tend to revert to a form of pearlite which is relatively soft and changes very little in volume. Conversely, a high alloy carburizing steel such as 9315 will tend to form some martensite completely through the core, even though the carbon content is low, thus promoting some expansion. In the same manner the case portion will form the hardened structure and tend to expand, so that the alloy types of carburizing steels, due to their higher hardenability, will generally show considerably more expansion upon hardening. Here again the factor of retained austenite frequently plays an important role, with a tendency to retard the volume increase in the surface layers.

Figure 5 is a photomicrograph showing a cross section of a carburized and hardened case on 9315 steel. The edge of the case is shown near the top of the picture. This serves to illustrate the dual structure where

one micro constituent tends to assume the maximum volume while another retains the minimum volume. The darker constituent is martensite, while the white portions are retained austenite.

*(To be concluded in the February issue)*



# Retirees Mix Work with Play . . . . .

By HOWARD CAMPBELL\*

*Curt Joa says, "If you can't get the men to come to the plant, take the plant to the men."*

WITH the labor market in short supply, so far as high-grade toolmakers, diemakers, and experienced all-round machinists are concerned, Curt G. Joa has discovered that a "gold mine" of skill and experience is building up in a spot where there has been practically no

market for it. He has staked a claim on this lode, but he can't begin to make use of all of it; there is enough for many more prospectors.

The Government Social Security program has fostered the retirement, at age 65, of a great many skilled mechanics and artisans who otherwise would have continued working at their trades. Social Security,

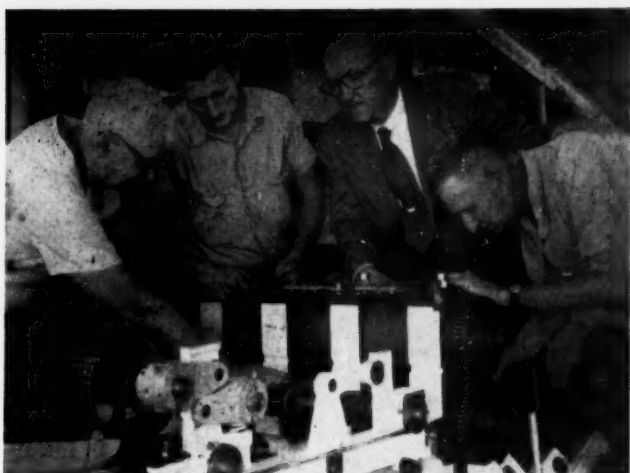
alone, will hardly provide a comfortable living for men who have been accustomed to high wages, but when added to perhaps a small income from savings, or a company pension, the total comes to enough to make retirement possible at the age when a rest is welcome.

However, there are many men of retirement age who still find happiness in work, and to such men, retirement is often more of a burden than a welcome change. The opportunity to bask in the



Fig. 1 — Curt G. Joa (seated) is shown here discussing design problems with Gene F. Kiela, director of engineering sales and advertising.

**Fig. 2—A group working out a problem in assembly. From left to right are William Ladwig, 69; Karl Muehlberg — a Navy veteran who is taking apprentice training; Mr. Joa; and Frank Rydberg, 74.**

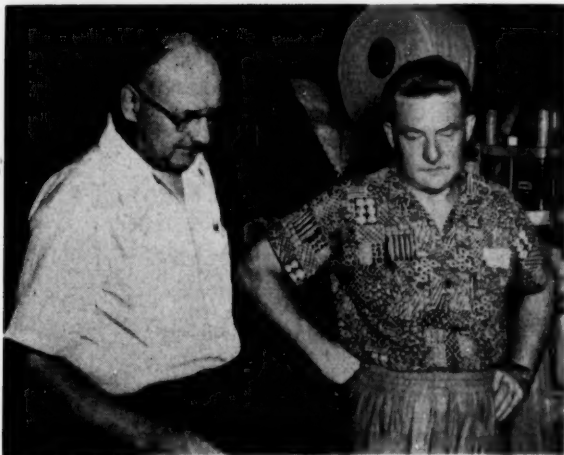


sunshine, to go fishing, or to play shuffleboard, or to do all the things that we all plan to do when we have all the time in the world soon begins to pall, and the man who has spent the greater part of his life on productive work of the finer sort begins to feel a nostalgia for the familiar smell of metal and oil, and for the feel of machine controls under his hand.

To many men, the ideal situation would be the opportunity to work at their craft a few hours each day, and

then take the rest of the day to play or fish. Also, the income from such part-time work would add enough to their retirement income so that they could more closely attain the living standards to which they had been accustomed.

Like every other manufacturer whose production problems involve the employment of highly-skilled mechanics, Curt G. Joa, President of Curt G. Joa, Incorporated, of Sheboygan Falls, Wisconsin, has had to face the problem of finding or training skilled help. His com-



**Fig. 3—(Left) Karl Muehlberg, Sr., Shop Superintendent, and (right) R. J. Kenney, Chief Designer and head of the Joa organization at Lake Wales.**



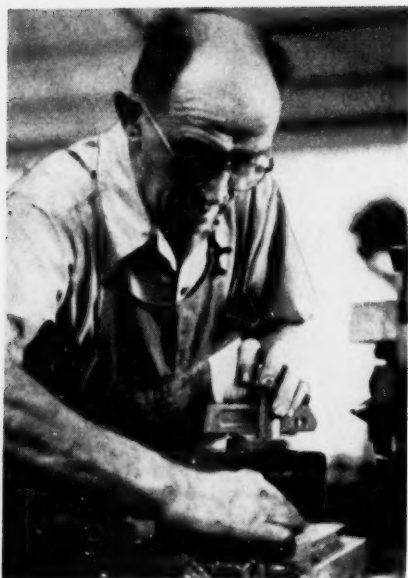


Fig. 4—Charles Strauch, 63, formerly lived at Colgate, Wisconsin. Finding the winters too rough as he grew older, he moved to Florida and is now with the Joa organization at Lake Wales.

to stay “on vacation” for some six weeks.

But Mr. Joa had discovered Florida, and the next year he went back to Palm Beach, taking some of his executive staff with him. Among them was Mr. Joa’s plant superintendent, Art Kohlhausen. Art began spending his evenings on the shuffleboard courts, and it was in this manner that he discovered the concentrated wealth of skill that had been lost to American industry.

Among his new acquaintances, Art discovered a number of men who

pany designs and builds special machines for the production of hygienic products, woodworking and furniture-making machines, machines for wrapping such commodities as brick ice cream, and other machines for special production tasks.

A few years ago Mr. Joa was ordered to take a vacation, after he had jeopardized his health by working long hours on design and production problems. Mr. Joa went to Palm Beach, Florida, to loaf, but after a few days of idleness he found an empty office, hired a secretary, and wired his plant in Wisconsin to send him daily reports on the progress of the business. Joa managed

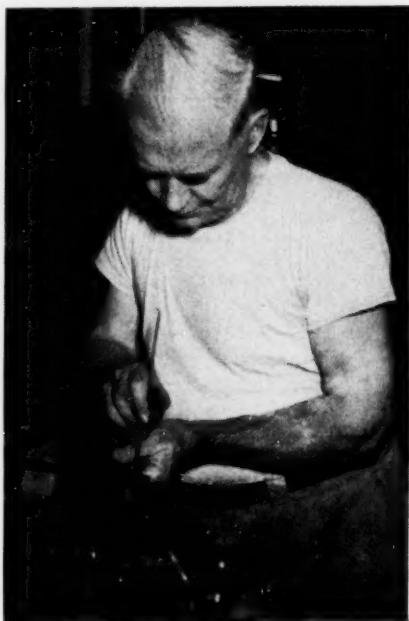


Fig. 5—Laying out a part for a die is A. Marriott, whose wealth of experience is being salvaged at the Joa plant.



Fig. 6 — Working on the assembling of a pulp batt unit for a machine to produce a hygienic product are three men—Joe Sosa, Ralph McKay and William Ladwig — whose combined experience of more than a century would be lost to industry without the opportunity provided by the Joa plan.



had spent the greater part of their lives at toolmaking, die-making, or other highly - skilled trades, and he

reported this fact to Mr. Joa. Joa immediately realized the possibilities and began planning to take advantage of the situation.

Mr. Joa set up a small plant at Fort Pierce and began making component parts for some of his products, for which he hired a force of approximately thirty-five men. Because of the difficulties with Fort Pierce zoning restrictions, Mr. Joa moved his plant to Lake Wales, where he was able to obtain a plant and facilities ideally adapted to his needs.

Mr. Joa then began advertising for skilled mechanics to work four-hour days, and the response was immediate. Growth is slow, but Mr. Joa expects to have 200 men at work within a short time. He is adding new machines and equipment as the operations expand, and already has a well-equipped shop, including an engineering department.

The Joa plant at Sheboygan Falls,

Wisconsin, builds some three million dollars worth of woodworking and special-processing machines yearly, and Mr. Joa plans to have as many of the components as possible made in the Lake Wales plant. For this work he will employ part-time mechanics, tool and diemakers, engineers, and draftsmen. However, Mr. Joa figures that approximately one-fourth of the force will be on the job full time so as to ensure continuity of operations. Mr. Joa is a licensed pilot and flies his own plane, with which he plans to make frequent trips between Lake Wales and his plant in Wisconsin.

Asked how his "four-hour day" idea is working out, Mr. Joa replied, "Everyone is benefiting. By the time a man has reached retirement age, he has accumulated a wealth of information, training and experience that a younger man couldn't possibly have. He is at the height of his usefulness so far as ability is concerned.

However, at that age many men just don't have the stamina to keep up the pace for a full-length work-day any longer, and for such men the four-hour day is the ideal situation. When he begins to get tired, it is time to quit.

"Our four-hour day plan gives him a chance to keep his hand in the work he loves, and it gives him enough additional income so that he can have the extra things he needs to make life comfortable and interesting. It is an ideal plan.

"Besides, these oldsters make excellent teachers for younger men—and there are plenty of young men in Florida who will welcome the opportunity to learn a highly-skilled trade, especially when they can learn under the tutelage of men who have spent the greater part of their lives in this work. There is no substitute for experience.

"We will always have a place for these highly-skilled oldsters, and we

will be training expert mechanics for future use."

One of the Lake Wales organization is Charles Strauch, age 63, who retired after forty years of service as a machinist in the Midwest. Mr. and Mrs. Strauch have retirement income, but Mr. Strauch wasn't happy about the prospect of unending days of idleness. When he learned of Mr. Joa's proposed plan of four-hour days for retired artisans and mechanics, Mr. Strauch immediately made application and joined the Joa organization. At present he is working full eight-hour days, but plans to take advantage of the four-hour provision later.

George Issitt had been a toolmaker with the Pontiac Motor Division of General Motors Corporation, at Pontiac, Michigan, for many years. When Mr. Issitt reached retirement age, he and Mrs. Issitt moved to Florida. Mr. Issitt is now designing tools, jigs and fixtures for Joa at the

Lake Wales plant.

Up until last winter, Joa's chief designer at the Sheboygan Falls plant was R. J. Kenney. Liking the milder climate and easier living conditions available in Florida, Mr.

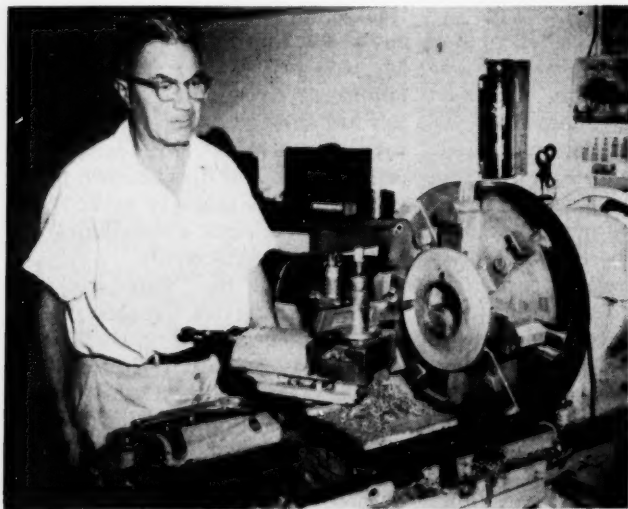


Fig. 7—Vincent Guglietti — once retired, but now back at his trade — faces a forging in a Lodge & Shipley lathe.

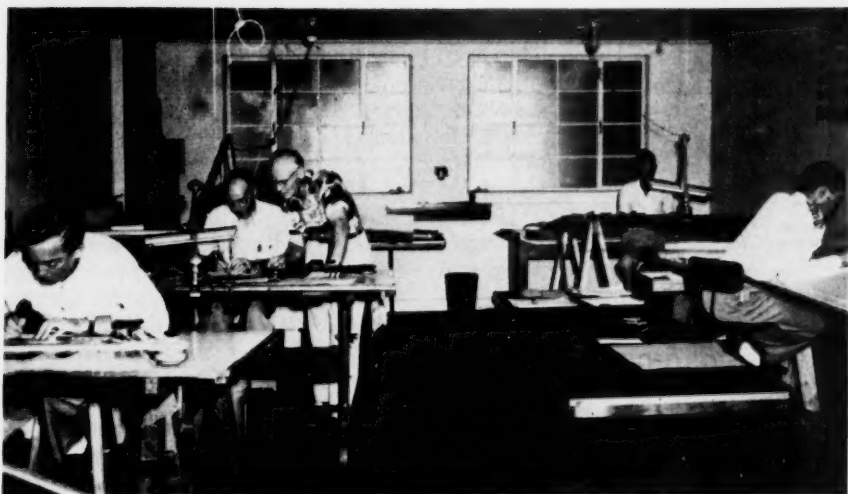


Fig. 8—Drafting room in the Joa-Lake Wales plant.

Kenney moved his family to Lake Wales, where he heads the Joa Company's Florida operation and continues his work as a designer of Joa products.

Discussing the Joa plan, Mr. Kenney said "With our four-hour day program we are assured of an adequate supply of highly-skilled mechanics. At the same time, these men have time to fish, or to raise flowers, or to do many of the things they

had looked forward to doing when they had reached the age of retirement. And in this climate they will live longer and feel better, their years of usefulness will be extended, and they can have the fun of picking their oranges and grapefruit from their own trees. The Joa Plan means the salvaging of countless years of practical experience that otherwise would be lost to American industry."

---

### History of Forging Film

"5,000 Years of Forging," a 20-minute, 16-mm., black and white, sound film, has been announced by Utica Drop Forge & Tool Corp., Utica 4, N. Y., and is ready for distribution to industrial and trade associations, schools and educational groups, civic groups, churches, clubs, and so on. The film deals with the history and the mechanical progress of forging from its inception by primitive man 5,000 ago to today's modern methods. To depict

hand forging of early American tools, photographs were taken at the Village Blacksmith Shop of the recreated Village Crossroads at the Farmer's Museum in Cooperstown, New York. Other scenes show the manufacture of drop forged wrenches at the Utica plant where the latest methods apply pressure up to 1,600 tons to forge parts to tolerances of a few thousandths of an inch. With the exception of nominal shipping charges, the film is available free of charge.

# Pressure Vessel Fabrication in New Plant . . . . .

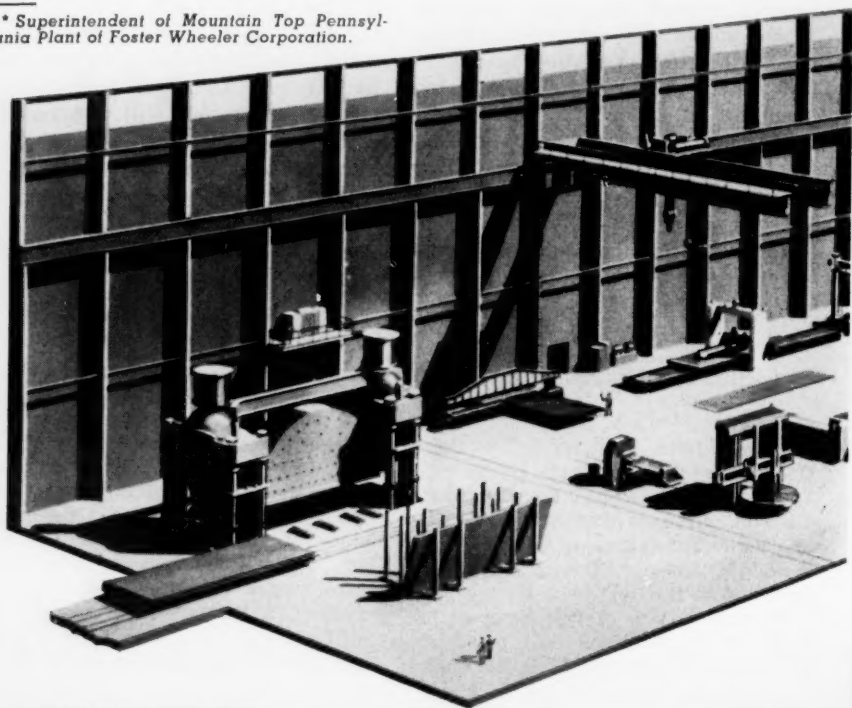
By KENNETH L. WALKER\*

*Giant size tools are featured in the building  
of huge processing equipment.*

**F**OSTER Wheeler Corporation is fundamentally a manufacturer of heavy industrial equipment. This includes steam generating units, such as are used in central stations

of public utility companies, as well as the condensing and fuel pulverizing equipment, heat exchangers, and evaporators required in such installations. Similar equipment is al-

\* Superintendent of Mountain Top Pennsylvania Plant of Foster Wheeler Corporation.



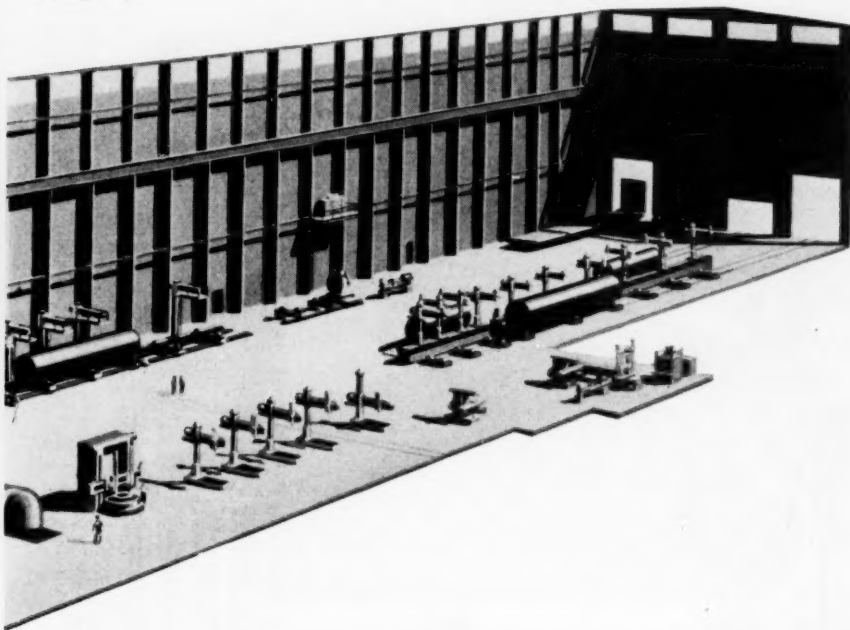
so furnished for marine service. The Foster Wheeler name plate is familiar to the operators of power plants aboard many of the vessels of the U. S. Navy, as well as leading passenger ships, freighters and Great Lakes cargo vessels.

Delivering a complete oil refinery—including the design of the plant, fabrication of the equipment, and erection of the completed units—is another phase of Foster Wheeler activity. Chemical plants, which include manufacture of nitrogen from the atmosphere, synthetic ammonia plants, fertilizer plants and the like, are also designed and built by the company.

For many years, Foster Wheeler has been operating plants in Carteret, New Jersey; Dansville, New York; St. Catharines, Ontario, Canada; and Egham Surrey, England, which provide for the design, engineering and fabrication of heavy equipment. This month another Foster Wheeler facility begins oper-



Kenneth L. Walker



Artist's view of interior of the new \$5 million Foster Wheeler plant showing many of the unique machines that are being used to process pressure vessels of unusual proportions. Shown in this drawing (left to right in back row) are: an 8,000-ton beam press, plate edge planer, overhead cranes, double housing planer, automatic welding machines, and drum facing machine. In the foreground (left to right) are: a 500-ton crimping press, a 144-inch vertical boring mill, pinch-type bending rolls, and high-speed radial drills.

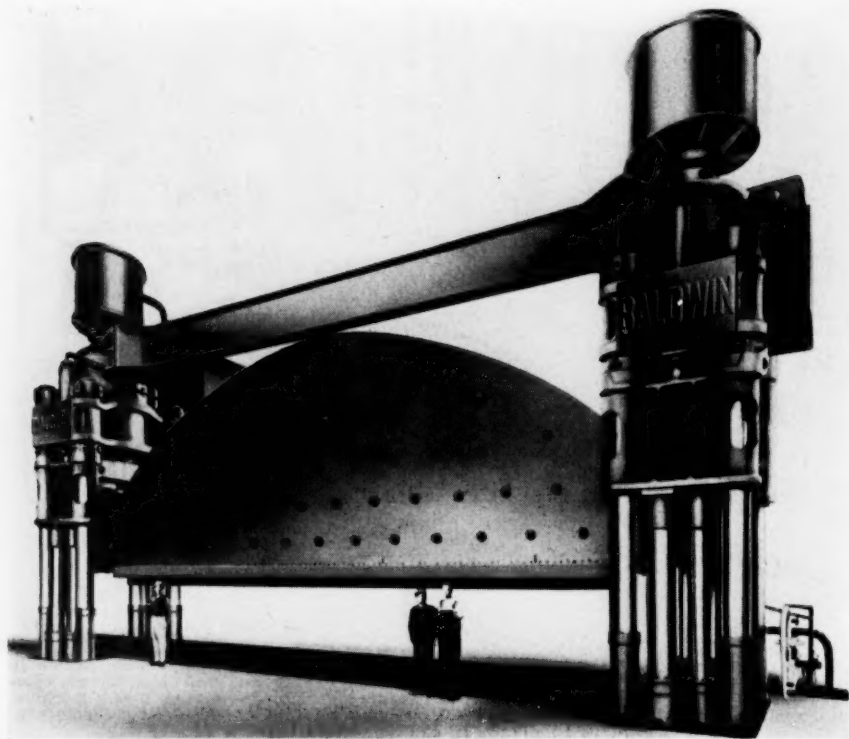
ations—a new plant located at Mountain Top, Pennsylvania, in the heart of a rapidly growing industrial region located some nine miles south of Wilkes-Barre.

Equipped with the most modern fabricating tools, the \$5 million plant is designed to turn out pressure vessels of varying proportions, including some of the largest and heaviest in demand. Among the new tools installed in this plant is the 8,000-ton hydraulic beam press shown in Fig. 1 which has a remarkable effectiveness in bending heavy steel plate, hot or cold. Built by

Baldwin-Lima-Hamilton, the press is one of the largest of its kind ever made. It can bend hot steel plate eight inches thick, or lighter plate up to 40 ft. long into half shells, which, when welded together, will form the largest and heaviest pressure vessels.

The press is hydraulically operated, using the simplest type of circuit, which is aided by valves and pressure gages, to protect the system against over-loading. Control of the speed of the moving beam is at the discretion of one operator. Such control is accomplished by means of a single lever, the position of which

Fig. 1—This 8,000-ton hydraulic beam press, one of the world's largest, is capable of bending steel plate of 8 inches thickness.





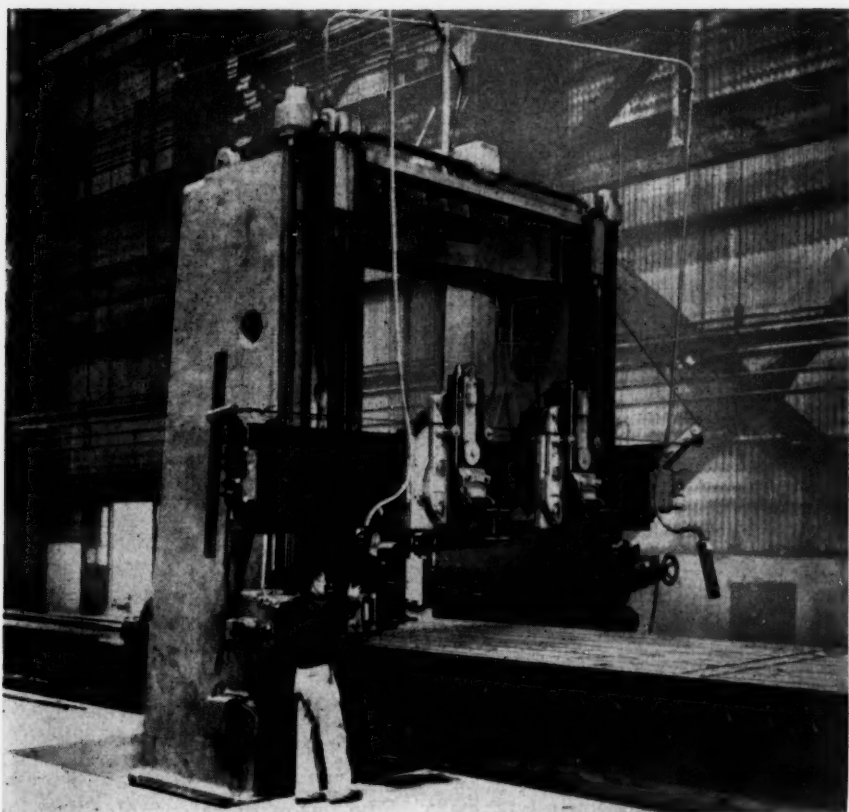


Fig. 2—The planer shown here has a table travel area of 44 feet, overall bed length of 92 feet, and width between the double housings of 122½ inches.

determines the speed and direction of motion up or down. This is effected by means of a mechanical linkage between the operator's lever and four Oilgear pumps, of the reversing type, coupled to two 200 hp double end motors.

Actually, the structure combines two four-column presses in one, each with a capacity of 4,000 tons. The two sets of columns are coupled together by laminated steel beams—

one set attached to the bottom platen and one to the moving platen—to form a single unit capable of exerting loads up to 8,000 tons on the plate to be formed.

The presses are designed to provide daylight of 96 in. maximum between the lower surface of the upper bending beam and the upper surface of the lower bending beam. All rams have a maximum stroke of 60 inches. Maximum operating speed under no-

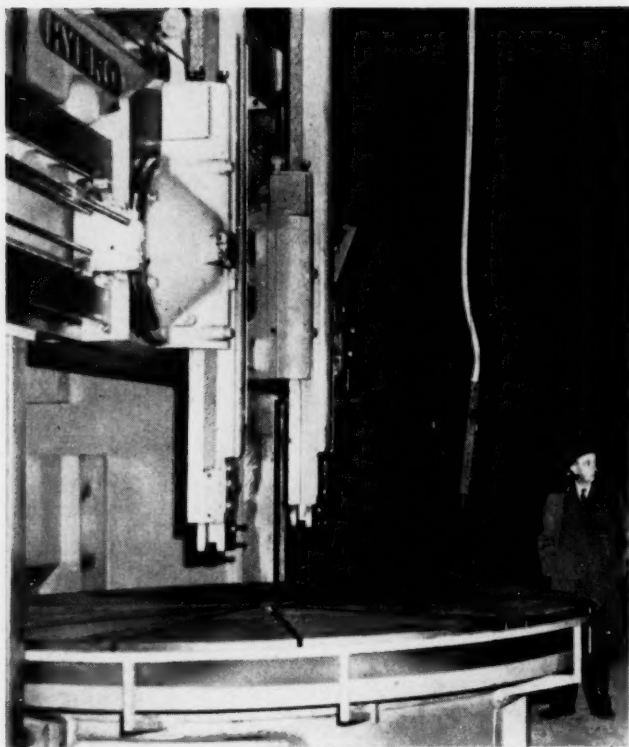


Fig. 3—Shown here is a view of a Hypro boring machine which has a maximum swing of 151 inches and height under rail of 86 inches.

tical plane. Vertical strokes of these rods are 13¼ in. The lifting pins have a horizontal movement of 3 in. to either side of the vertical centerline. The positioning toggles, hydraulically operated, are built into the lower press beam. A 7 gpm, 2,000 pse, Vickers Pump, directly coupled to a 7¼ h.p. motor, operates the device.

load conditions, up or down, is 82 in. per minute; maximum pressing speed is 12 in. per minute up to 8,000 tons.

To facilitate handling of the hot steel plate, there is also a unique plate handling device which positions the plate to be formed, easily and with minimum loss of metal temperature. Especially designed by Baldwin-Lima-Hamilton, the plate-joggling mechanism will handle plates up to 40 tons each. It consists of four 7 in. diameter lift cylinders, eight 3¼ in. diameter manipulating cylinders, rollers, push rods and pins. The push rods are hinged for back and forth movement on a ver-

The entire press occupies a surface area 65 ft. x 20 ft. Its 60 ft. height is distributed above floor level (38 ft.) and below, in a 22 ft. pit. To support its three-million pound weight, the foundation on which it rests required 750 cu. yards of reinforced concrete; beneath this foundation is bedrock.

The bed planer shown in Fig. 2 has a table travel area of 44 ft., overall bed length of 92 ft., and width between the double housings of 122½ inches. This giant planer was manufactured by Giddings and Lewis of Fond du Lac, Wisconsin. A new Hypro boring mill at the new plant,

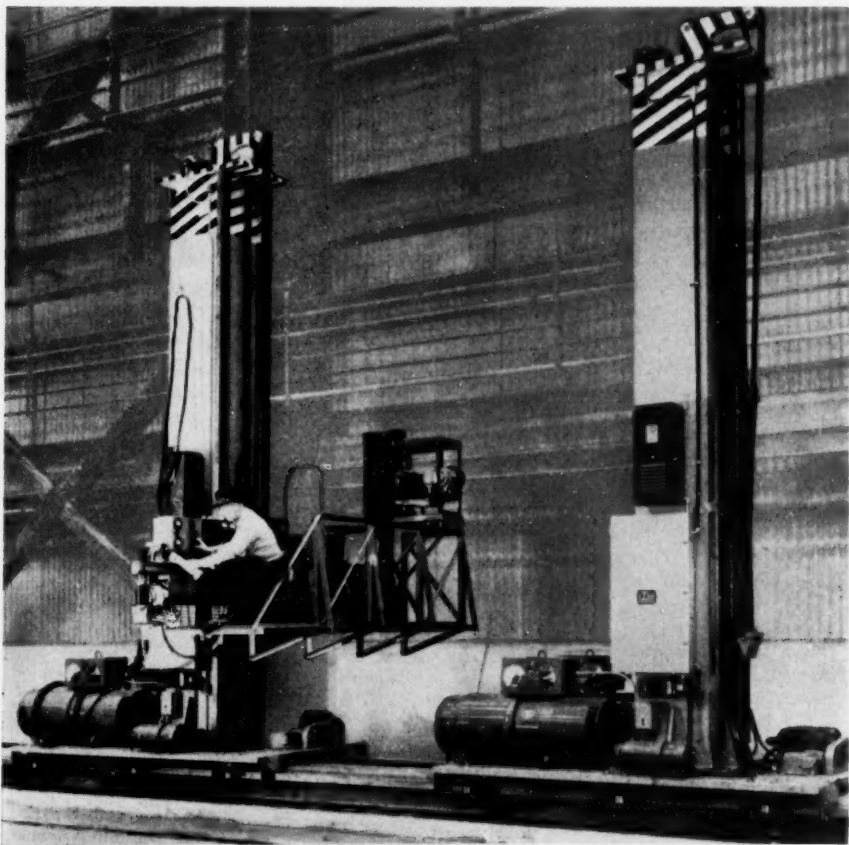
as shown in Fig. 3, has a maximum swing of 151 inches and height under rail of 86 inches.

A new automatic shielded welding process installed at the new plant was built to specifications by Cecil Peck Company of Cleveland and Lincoln Electric Company. The automatic welding machines, as shown in Fig. 4, are power-driven and rest on bases which can be raised or low-

ered to accommodate vessels up to 12 ft. in diameter and which travel on a track 150 ft. in length. The units are type LAF, automatic flux recovery, power-driven booms which are controlled at the operator's station. These automatic welders are capable of welding plate 8 in. thick at speeds considerably faster than single wire welders.

Essentially, the process operates

Fig. 4—View of twin-arc welding machines which are capable of welding 8-inch thick plate at speeds considerably faster than in single-wire welding units. These welders are mounted on specially designed platforms which travel longitudinally on a 150 ft. long track and may be raised or lowered to accommodate pressure vessels up to 12 ft. in diameter.



in the following manner: Granular flux is deposited on the joint to be welded, deeply enough to cover the completed weld, as illustrated diagrammatically in Fig. 5. Bare metallic welding electrodes in tandem are power-fed into the blanket of flux at rates of feed controlled automatically for proper arc length. Direct current produces the hidden arc between the electrodes and the joint. The resultant arc heat fuses electrodes and parent metal, producing the weld. Flux adjacent to the arc melts, floats on the surface of the molten metal, then solidifies as a slag on the top of the weld. Since the arc and molten metal are blanketed by flux at all times, the weld metal is protected from contact with the air, assuring maximum quality of welds and making possible the use of extremely high amperage for faster welding and lower costs.

While there is little difference in

quality of weld obtained between alternating current and direct current welding, the direct current system was chosen because of the unique Foster Wheeler arrangement whereby the entire welding unit travels over the length of the 150 ft. track. Being lighter, the DC unit has the advantage of eliminating bulky transformers, which would have to travel with the welder along the track.

Contact with power source is obtained by a hidden track below the floor similar to the third rail used for electric trains. Power consumed by one of the welding units is approximately 50 kilowatts. In the case of welding circular seams, the portable welding machine is held in one position and the drum revolved by means of power rolls. In addition to the automatic machines of the type shown in Fig. 4, portable welding machines, both DC and AC, are used.

Another outstanding tool is a two-million-volt Van de Graaff, X-ray generator as shown in Fig. 6, designed for use in penetrating steel thicknesses up to 12 inches and pho-

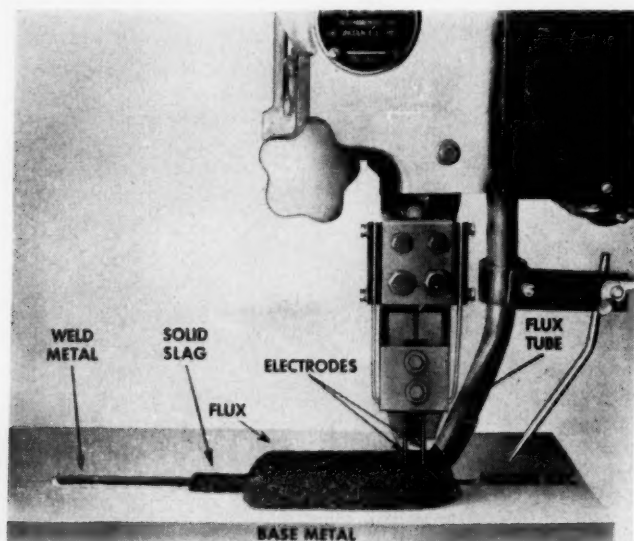


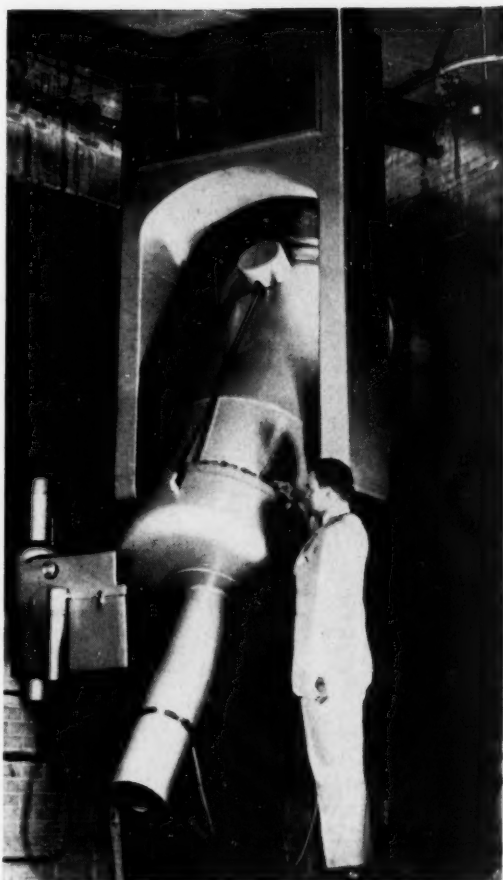
Fig. 5—Detail drawing showing setup of type LAF, automatic flux recovery twin-arc welding machine.

Fig. 6—First super voltage X-ray machine of its type to be used in industrial radiography, this 2-million-volt Van de Graaff generator is capable of penetrating steel thicknesses up to 12 inches.

tographing weld metal to detect flaws, holes or scale that may form in such material. First super-voltage X-ray machine of its type to be installed for use in industrial radiography, the unit is designed for use in the examination of weld structures with unprecedented clarity of detail, using fewer exposures and performing its work in considerably less time than with conventional X-ray equipment.

The unit is housed separately in a massive concrete structure, as shown diagrammatically in Fig. 7. To assure the safety of plant personnel in the event of escaping rays from the powerful machine, elaborate precautions were taken in designing the building. A fortress-like structure of puddle concrete and steel, with walls four feet thick that rise 35 feet on the side fronting the main plant, and 25 feet on the remaining three sides, the building is located a distance of 550 ft. from the main plant.

A huge concrete door, weighing 108 tons, serves as an entry for flatcars delivering steel to be X-rayed. The door, 18 ft. wide x 19½ ft. high, is mounted on rollers and operated by motors. Personnel enter the de-



veloping and inspection sections of the building through a maze of walls.

The X-ray generator is suspended on tracks from a crane trolley. This provides travel over the plan area of the X-ray house, as well as a vertical drop of 24 ft. The X-ray machine body is connected to a tuning fork support attached to a circular raceway permitting vertical rotation of 180 degrees and horizontal rotation of 360 degrees. It is op-

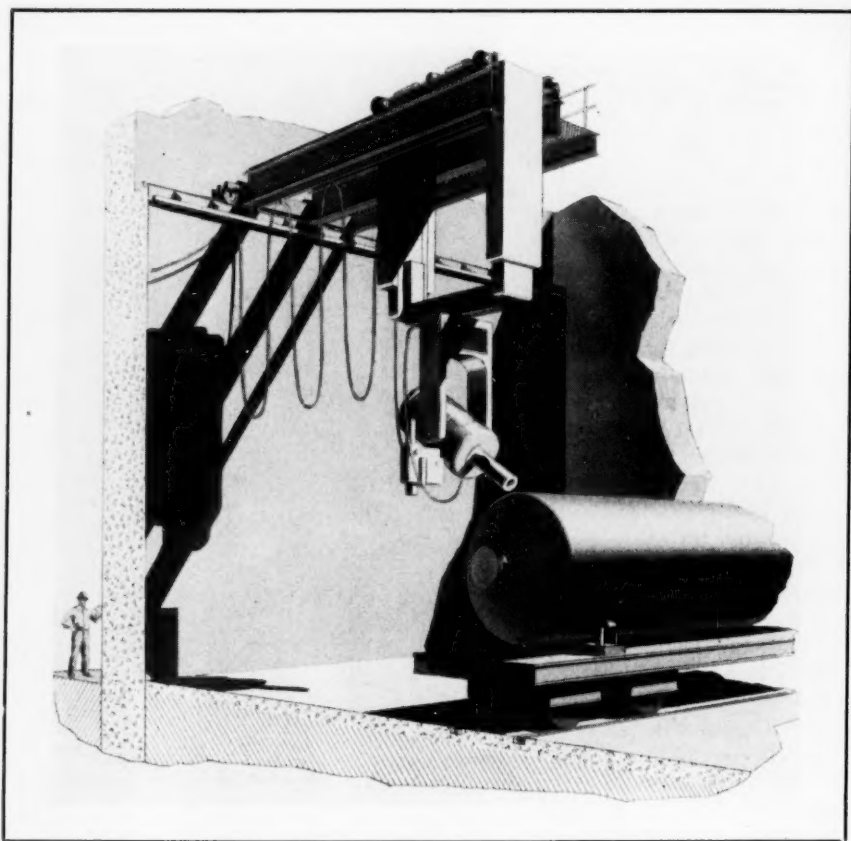


Fig. 7—This artist's detail drawing illustrates how the 2-million-volt crane-supported X-ray appears in operation within its own special building.

erated from a desk-type console.

In radiography, the X-rays penetrate heavy steel thicknesses and expose photographic film to a degree determined by the amount of steel that is in the path of the X-rays. By using two-million-volt X-rays, the range of penetration within which minute flaws may be recorded on the film is up to 12 inches of steel thickness—a result never before achieved in private industry.

To obtain results of this magnitude, the generator continuously transfers the electric charge into an insulated hemisphere, by means of a rapidly-moving, endless belt. A glass-and-metal tube, under high vacuum internally, is mounted between the high-voltage hemisphere and the base of the X-ray unit. Inside this tube, electrons are accelerated by the high voltage to very high velocities, only to be stopped by a





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**DON'T** put too much pressure on forward file stroke.

**DON'T** drag file back under pressure.

**DON'T** let files become clogged with dirt or filings.

**DO** "tap" file frequently (on wood) to loosen chips; also clean with file brush or "card."

**DON'T** throw files on top of one another.

**DO** keep files separated (in racks).

**DON'T** let files rust. (Dulls teeth.)

**DO** use *The right file for the job.*\*

### \*CONSULT YOUR INDUSTRIAL DISTRIBUTOR

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# NICHOLSON...A FILE FOR EVERY PURPOSE

thick gold plate, thereby producing the highly penetrating X-rays needed for such specialized operations as will be performed at Mountain Top.

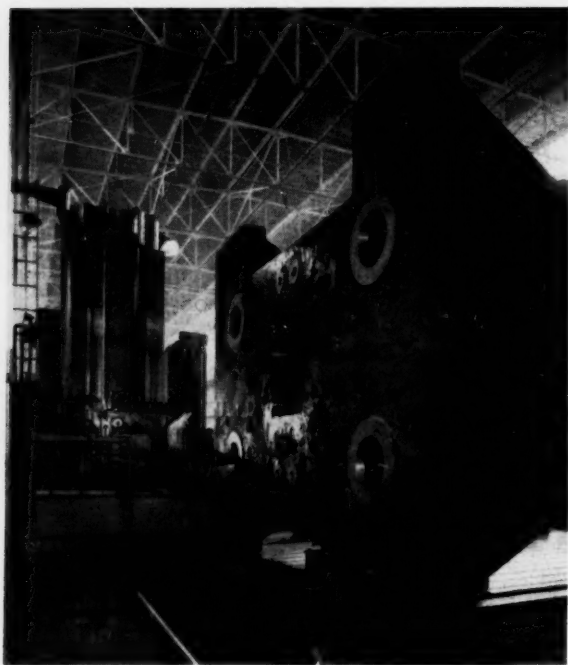
Photographs of completed welds are developed and inspected in a separate wing, outside the X-ray room. These films become a part of the fabrication record and are retained for 10 years after the welding has been completed.

Arrangement of the drilling equipment for the new plant was designed to permit maximum utilization of each drill, as well as speedier operation. The plant is equipped with two sets of high speed radial drills, each with an eight-foot arm and 19-inch column, mounted and arranged in series—one set of six, with the two

end drills fixed, and another of four, with one end drill fixed. Besides, there are several single mounted drills located in a side bay which will be used for lighter work.

The radial drills are mounted along a 230-foot section of raised track and may be positioned, by power equipment, anywhere along the ways. Drums or other pressure vessels to be drilled may be placed on both sides of the ways and laid on power rolls that permit easy turning of the cylinders.

With this arrangement, any combination, using up to six drills on a single drum, is practical. This also permits 100 per cent use of the drills at all times, regardless of the number or size of units to be drilled.



### Machining Huge Casting for Laboratory Press

**T**HE mammoth steel casting shown here—with being machined on an 8-inch bar horizontal boring mill is indicative of the size and scope of work involved in building one Lake Erie Hydraulic Press. This unit, a typical example, weighs 168,000 lb., is 220 inches long x 66 inches deep, and towers 192 inches. Upon completion, the casting will become the bed or bottom platen for a 5,000-ton laboratory press designed and built for advanced study of metals under pressure.

# Users report excellent results with New Sunicut S Oils

In just six months, these unique new straight cutting oils have "Job Proved" themselves as top performers in many metalworking shops all through the industry.

From the field, reports like these keep coming in:

**LARGE IMPLEMENT MANUFACTURER TELLS US,** "We get better finishes in our broaching operations with Sunicut 110-S, and our operators favor its light color."

**SCREW MACHINE SHOPS REPORT,** "The versatility of Sunicut 209-S permits us to reduce the number of oils we must stock."

**AN AUTO PARTS MANUFACTURER INFORMS US,** "Threaded parts are as much as 50° cooler when they come off the machines. And our operators like the clear, clean, odorless qualities of Sunicut 102-S."

**BROWN & SHARPE SCREW MACHINE OPERATORS SAY,** "Sunicut 11-S increases tool life, gives finer finishes, eliminates staining problem."

Let us show you how these new Sunicut S Oils can help you. For technical bulletins or the services of a Sun representative, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Department MM-1.

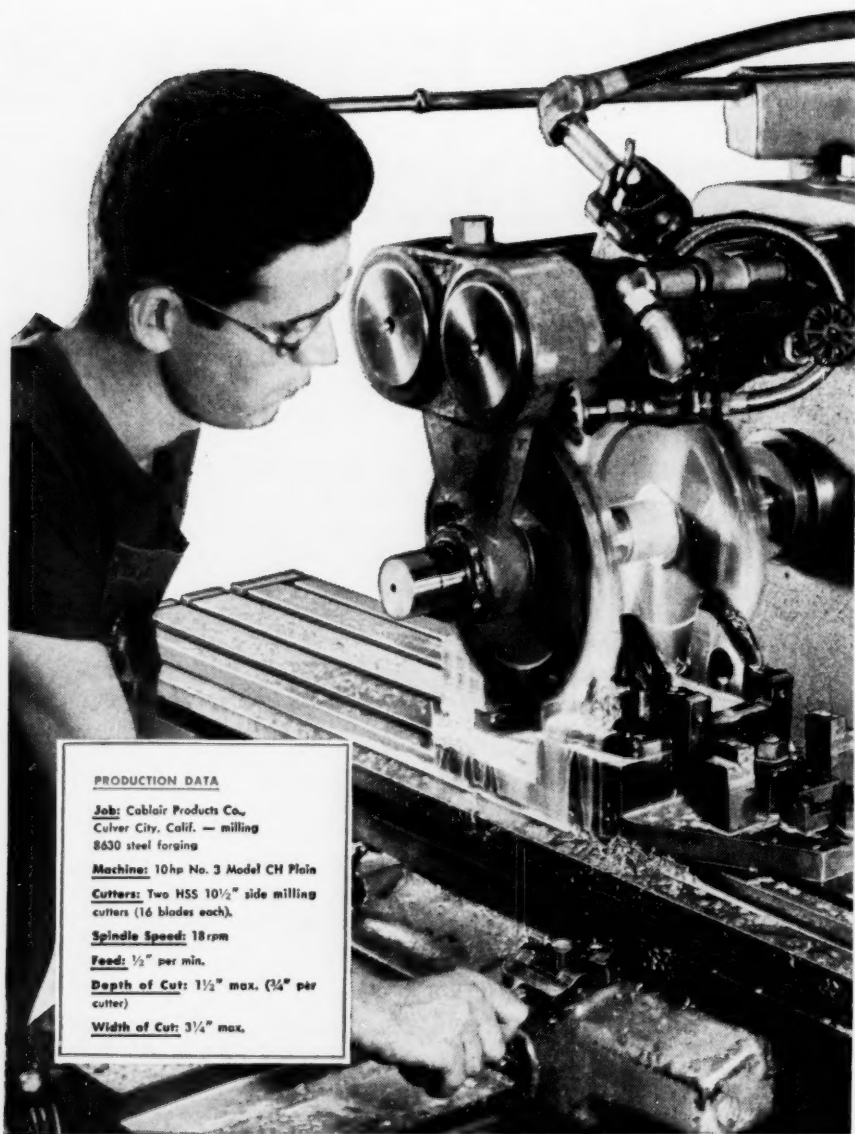
INDUSTRIAL PRODUCTS DEPARTMENT

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# Getting right speed



## PRODUCTION DATA

**Job:** Cablair Products Co.,  
Culver City, Calif. — milling  
8630 steel forging

**Machine:** 10hp No. 3 Model CH Plain

**Cutters:** Two HSS 10½" side milling  
cutters (16 blades each).

**Spindle Speed:** 187rpm

**Feed:** ½" per min.

**Depth of Cut:** 1½" max. (¾" per  
cutter)

**Width of Cut:** 3¼" max.

# selection for tough forgings— no problem with a CH machine!

•This Kearney & Trecker No. 3CH  
10 hp Milling  
Machine mills 100  
steel forgings  
between cutter  
grinds. Previous  
average was  
only 18 pieces!

Milling tough steel forgings might have presented a difficult production problem if this manufacturer had not owned a versatile No. 3CH miller. Tough material, the necessary speeds and size of cut combined to produce excessive cutter wear. An average of only 18 pieces could be machined before cutters had to be reground. This situation, unremedied, would have seriously restricted output and increased costs.

However, the CH miller's design provides a wide range of 24 spindle speeds (15 to 1500 rpm). By utilizing this feature, and selecting an appropriate coolant, the manufacturer increased cutter life by over 500%!

Today, uninterrupted runs of 100 pieces are average.

This case is only one of hundreds where CH design features provide the versatility to easily meet common as well as unusual machining problems.

For details on Kearney & Trecker CH machines, contact your representative or write to Kearney & Trecker Corporation, 6784 West National Ave., Milwaukee 14, Wis., for illustrated brochure.



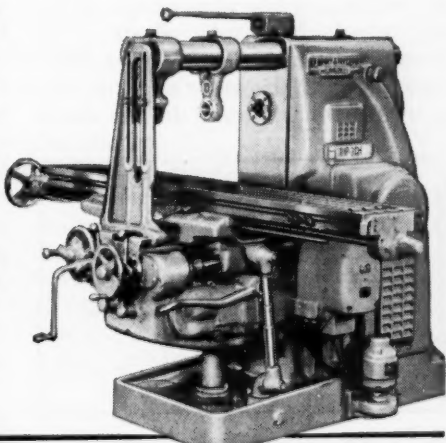
## Check these important CH features

**Extra wide feed range**— 32 changes from  $\frac{3}{16}$ " to 90" per minute meet requirements of new metals and cutting tools.

**Greater rigidity**— entirely new column . . . heavily ribbed, box section, sponson construction . . . absorbs vibration from heaviest cutting loads.

**Smoother feed performance** through a heavy duty 2" dia. table feed screw. Extra large bronze nut provides greater bearing contact for longer screw life and backlash elimination.

**Greater horsepower** through independent drives for spindle, feed and rapid traverse, and coolant. 10hp delivered to spindle . . . 3hp for feed and rapid traverse . . .  $\frac{1}{4}$ hp for coolant.



Kearney & Trecker 10hp No. 3CH  
Milling Machine.



**KEARNEY & TRECKER**  
**MILWAUKEE**  
**MACHINE TOOLS**



# Screw-Type Door and Cover Latches

By FRED ROGERS

*Numerous designs and suggestions for making such latches are presented.*

SOME type of latch is usually applied to doors on machine tool beds to facilitate the exclusion of dust, dirt, water, coolant, and oil. Such doors are used to cover tool compartments and gear, belt and chain, and sprocket drives, as well as coolant and lubricating or hydraulic oil sumps. Shelved work cabinets and electric panel cabinets, hand-hole and accessibility covers also fall into this category.

Many of these doors, made of cast iron, are either milled, planed, or surface ground on the contacting surface as are the pads on the parts against which they fit. Sheet metal doors are sometimes felt or rubber stripped near the outer edges by cementing this material to the door.

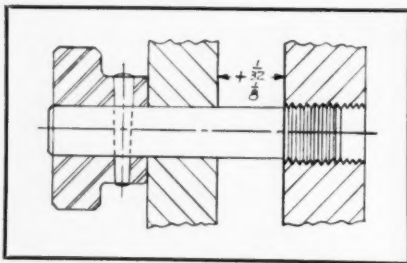


Fig. 1—Sketch of screw-type latch that is made from piece of screw stock and provided with knurled knob.

The layman sees these doors held shut by one or sometimes two latches, ranging from the bolt type as on a house door, through the cam types, hook bolt, spring backed detent, flat or humped spring, and others. However, where the highest efficiency is required, we have found the screw-type latch to be most useful.

Screw-type latches have an advantage in that any number can be used around the edge of a door or cover whether it is hinged or not. They are simple in construction and usually inexpensive. They can be knobbed or handled as desired or can be of the flush or streamlined type, operated by a right-angle hex wrench. They may be of the protruding screw head type that is loosened by an open end wrench, a monkey-wrench, or a screw driver, depending on the duty. Placed at intervals around a door, they provide a tight joint all around.

Probably the most important advantage of this multiple type of screw latch is that it is practically impossible for a new and inexperienced operator to lose or misplace the screws. After they are loosened, they will hang free or dangle in the



holes in the cover, but they will not fall free of the hole.

This article presents numerous designs and suggestions for screw-type latches. Generally, these latches can be divided into two classes—those for the heavier type of door or cover usually made of cast iron, and the lighter variety for doors made of sheet metal.

In Fig. 1, a piece of screw stock is threaded for a short length and the remainder then turned down to approximately the root diameter of the thread to serve as the main body.

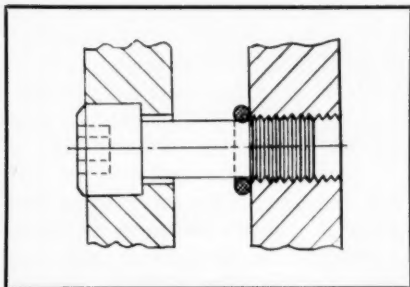


Fig. 2—A commercial socket head cap screw is used in this design of cover latch.

This body is inserted through a drilled or reamed hole in the cover with a loose running fit and into or through the knurled knob which is taper pinned to it. The coarser the threads, the fewer will be the turns necessary to free the latch. The threaded hole in the machine frame is usually designed to provide a very free fit. Engagement is facilitated and the screwing-in made easier if the first threads of both the screw and the tapped hole are relieved of the featheredge. A distance of from  $1/32$  to  $1/8$  inch greater than the

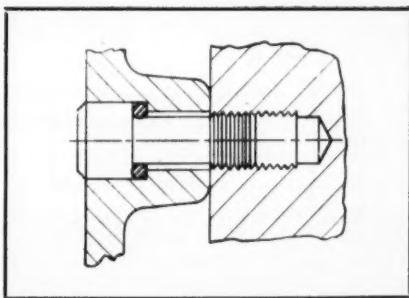


Fig. 3—Sketch showing design of latch for use where boss on door must contact mating piece.

length of the thread engagement must be provided for the screw threads to run into as the latch is being loosened. If the hole through the cover is not more than 0.004 to 0.005 inch greater than the screw body, the screw will have little or no tilt when completely withdrawn. This, of course, depends on the length of the hole bearing.

Purchasable screws, modified to suit this requirement, can be used for screw-type latches. A commercial socket head cap screw is used in the design shown in Fig. 2. Usually, a screw of the length shown is threaded nearly to the head. These threads and the unthreaded portion close to the head must be reduced in diameter. Such screws, although toughened by heat treatment, can be turned with a tool. A still better method is to chuck the screw by the head, feather



Fig. 4—The coil of wire used in the design shown in Fig. 3 can be cut from a spring as indicated in this sketch.

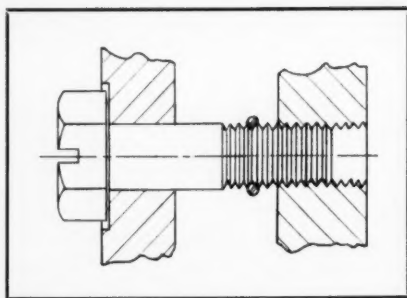


Fig. 5—In this design, a hexagon head cap screw is used for the latch.

male center the threaded end, and grind the wide relief as shown. The depth of this relief is approximately just below the root of the threads. An "O" ring, made of oil-resisting rubber compound, is forced over the threads to the position shown after the screw has been assembled with the cover. The outside diameter of the "O" ring need be only slightly larger than the body size hole in the cover. In this design and also in the previous one, the tapped boss is recessed below the finished surface against which the door rests. As a result, the screw will dangle when loosened, because of the short length of hole under the counterbored hole and because of the large diameter thereof.

When the door, or the boss on the door which accommodates the screw, must contact the mating piece, as indicated in Fig. 3, the screw retainer must be placed in another position than that shown in Fig. 2. The screw is of similar design as in the previous example but a coil of wire is snapped over the screw body and rests at the bottom of the counterbored hole adjacent to the bottom of

the screw head. The coil is so proportioned that its outer periphery hugs the outside diameter of the counterbored hole. This then is what keeps the screw from falling out. The hole around the body of the screw is sufficiently large for the threaded part to enter freely. If only a few threads are used to clamp—for example three—then the length of boss may be shortened.

The coil of wire referred to above can be cut from a spring in the manner shown in Fig. 4. If a lot of 25 latches is required, then a spring of proper diameter can be wound with 26 or 27 coils. The spring may be wound open like a compression spring or closed like a tension spring. The coils are ground apart as shown. The single coil is then held in a vise and the ends are pulled with a wrench so that the coil will lie flat after bending. The more open the spring is wound, the more bending is required to straighten; also the larger in diameter will it become during the straightening operation.

In the design illustrated in Fig. 5,

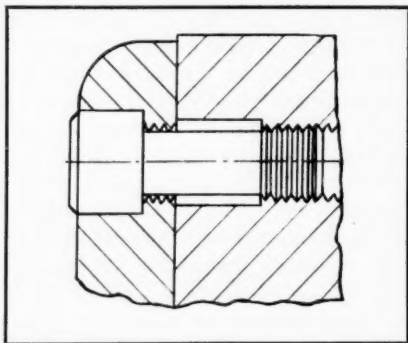
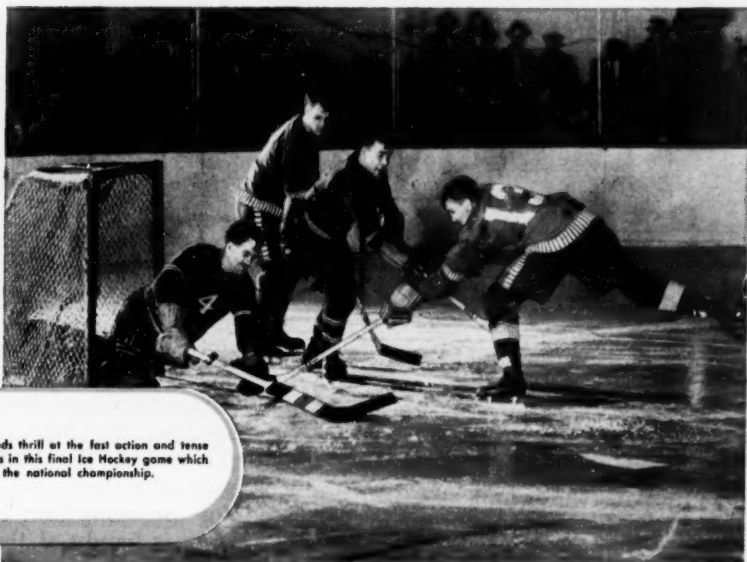


Fig. 6—This sketch shows another method of keeping the screw in place when the cover is opened or removed.



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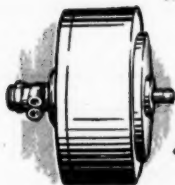
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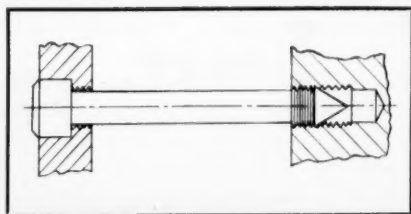


Fig. 7—In this design, the screw is pointed to a 60-degree included angle so that the point tends to lead the threads on the screw into the tapped hole.

a hexagon head cap screw is used for the latch. It is assembled with the cover and a single coil of wire is either snapped over the threads or screwed over the threads as desired to the correct position. The screw threads and the plain body of the screw are not turned down as in the foregoing designs. The door is spot counterbored for the collar under the hexagon head, the latter also being slotted across the flats so that either a wrench or a screw driver can be used for loosening and tightening, whichever is handy at the time. In this design, as in the design shown in Fig. 1, the screw will remain parallel with the hole if not too great a clearance over the screw is provided.

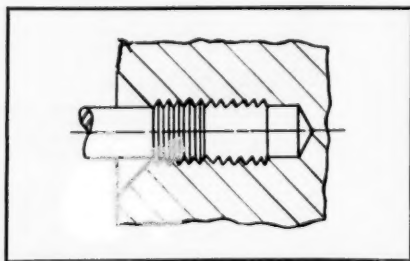
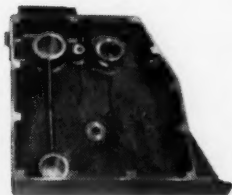


Fig. 8—In this design, the threaded hole is countersunk and the tip of the screw is left as originally chamfered; namely, 45 degrees per side.

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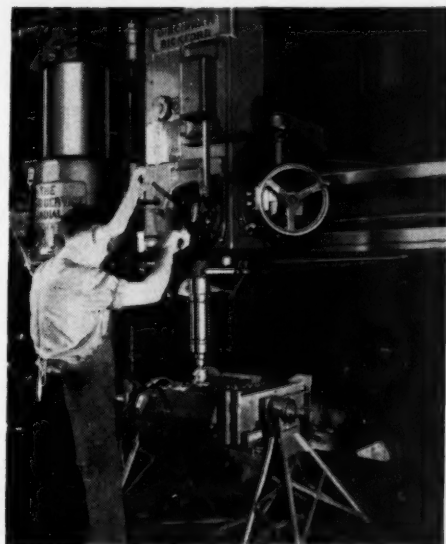


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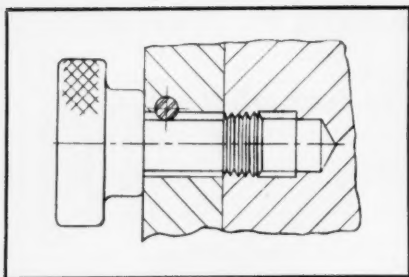


Fig. 9—This sketch shows another way of retaining the screw whereby the screw and knob are made integrally and a pin is provided in such a position that the threads on the screw leave the tapped hole before they contact the pin.

Figure 6 shows another method of keeping the screw in place when the cover is opened or removed. The screw body is relieved as in Figs. 1, 2 and 3, but a separate retainer is not required. The hole in the cover

directly beneath the counterbored hole is tapped out. The screw is then threaded through this hole until the threads on the screw run past the threads in the cover. If the cover contacts the other piece as shown, it will be necessary to provide a counterdrilled hole barely larger than the diameter of the threads. The screw threads run out into this cavity when the door is being opened, but not through the threaded hole in the cover.

If the tapped hole is of some distance from the door and a long screw is necessary, it becomes difficult to locate the screw hole with the end of the screw. This is caused by the freedom of the screw body in the hole of the cover. There are two ways in which this difficulty can be remedied, as shown in Figs. 7 and 8. In Fig. 7

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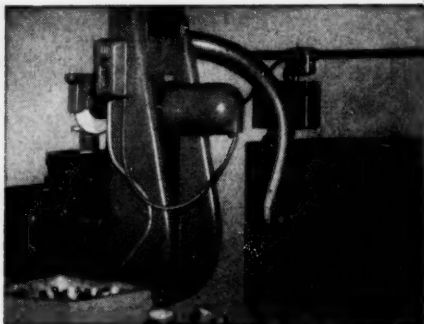
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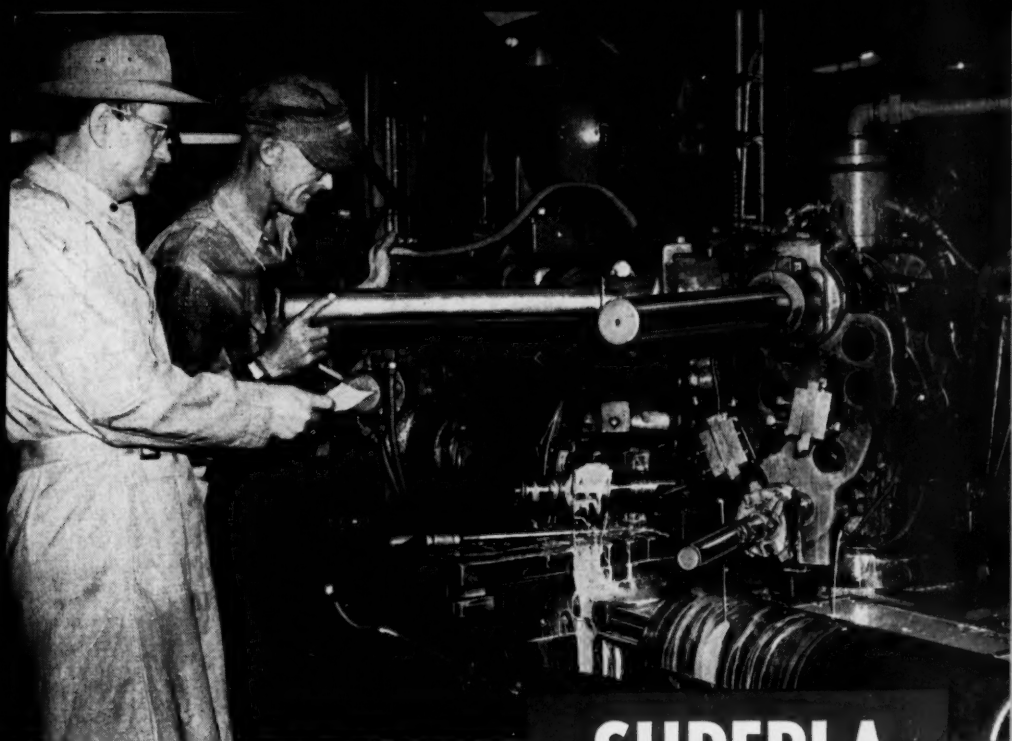
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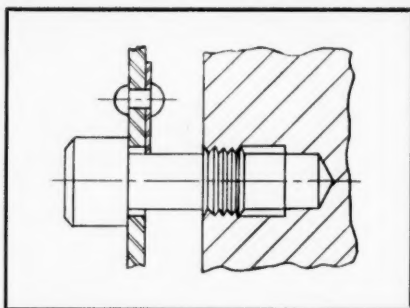


Fig. 10—In this design of cover latch, a socket head cap screw is used.

the screw is pointed to a 60-degree included angle. This point tends to lead the threads on the screw into

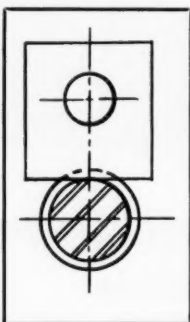


Fig. 11 — This sketch shows how a small thin piece of sheet steel, riveted to the inside of the sheet steel door, prevents the screw from falling out when the cover is opened.

the tapped hole. In Fig. 8 the process is reversed in that the threaded hole is generously countersunk. Such a countersink of 90-degree included angle has been found satisfactory. In this design the tip of the screw may

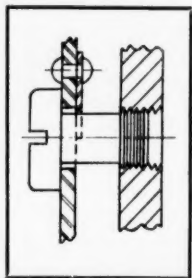
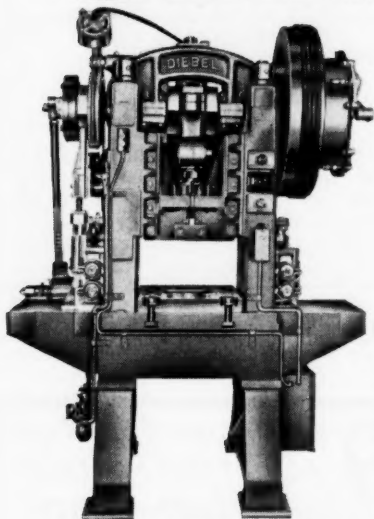


Fig. 12—This design of latch utilizes a screw with a short type slotted head.

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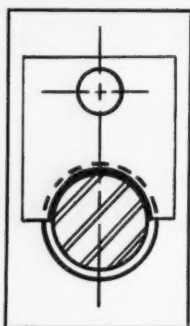


Fig. 13 — The spring steel retainer shown in this sketch has a semi-circular opening which fits over the screw body and half its circumference with a small clearance.

be left as originally chamfered; namely, 45 degrees per side.

Although the hole in the cover has been tapped and counterbored in this example, the other designs are applicable also for this long screw method.

Another way of retaining the screw is shown in Fig. 9. The screw and the knob are made integrally, the body being relieved as in some of the first designs illustrated. Because

the screw latch is placed near the edges of the cover, a pin hole is reamed perpendicular to the hole for the screw, and either a straight or tapered pin is driven in at such a position that the threads on the screw leave the tapped hole before they contact the pin. There is a dis-

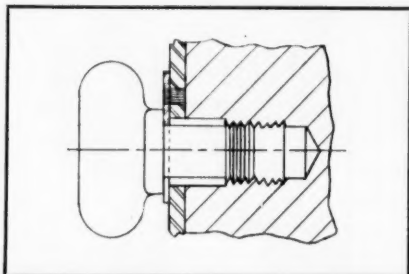
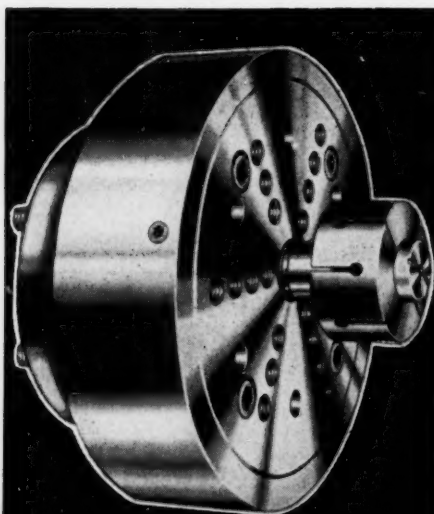


Fig. 14—The screw type latch shown in this sketch utilizes a retainer which is located on the outside of the cover.



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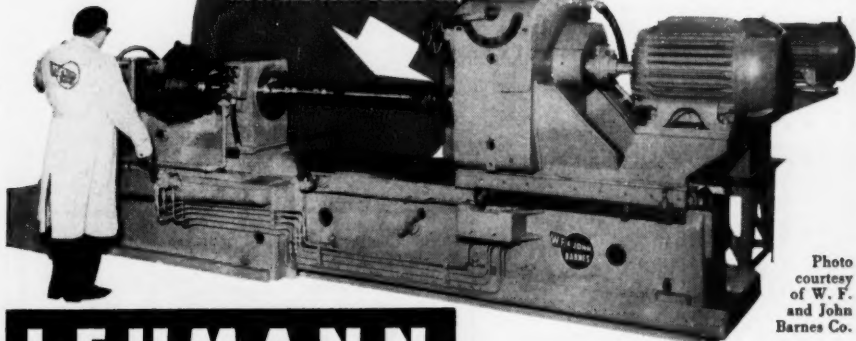


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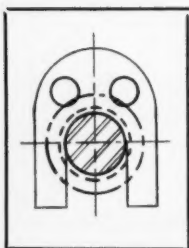


Fig. 15—Sketch showing shape of retainer used with the screw type latch shown in Fig. 14.

advantage of driving in the

pin as it must be drilled out if the need for its removal arises. A long dog-pointed headless set screw has been used in place of the pin but it must be jammed against the bottom of the hole or the threads must jam so that vibration will not tend to loosen the screw.

All the foregoing designs show doors made of cast iron. The next three drawings illustrate methods in which sheet metal doors are fastened

by screw-type latches. In Fig. 10, a socket head cap screw is used which is reduced in the body as in some of the other sketches. The sheet steel door is drilled so that the screw threads can pass through freely. The head of the screw rests against the cover. A small thin piece of sheet steel, preferably spring steel, as shown in Fig. 11, is riveted to the inside of the sheet steel door and just touches the body of the screw. With this interference on but one side of the screw, it can be screwed into the cover readily; however, the screw will not fall out when the cover is opened.

A similar arrangement is portrayed in Fig. 12. The screw has a shorter head, slotted as shown. The spring steel retainer has a semi-circular opening, as shown in Fig. 13, which

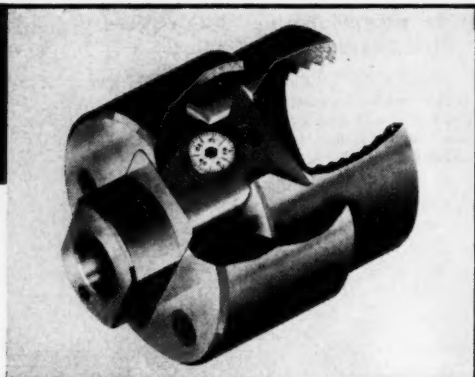
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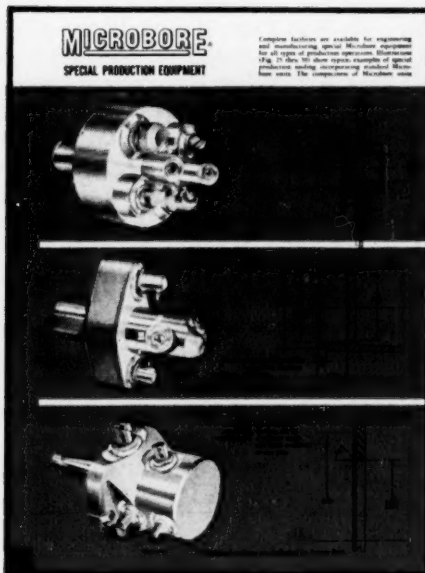
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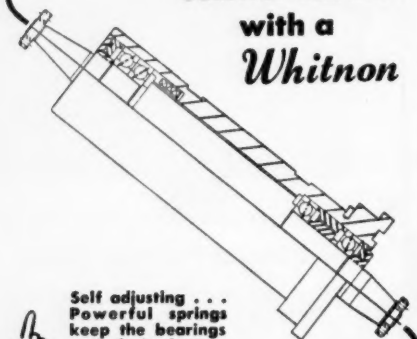
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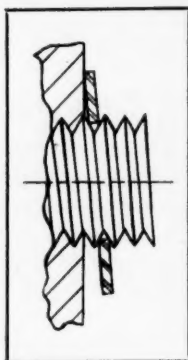
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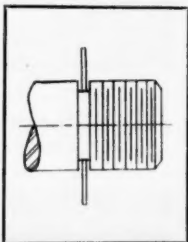
Fig. 16 — This sketch shows how a round thin washer screwed on the threads of the latch screw may be used as a retainer.



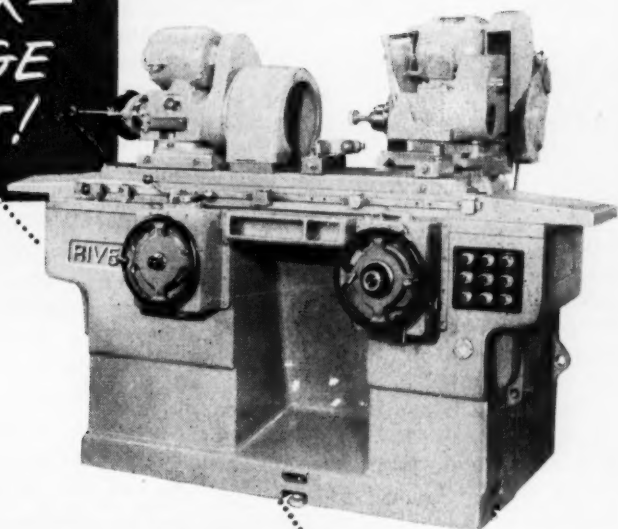
fits over the screw body for half its circumference with a small clearance. The retainer must be far enough away from the body so that the retainer groove will pass between the vee groove of the thread. However, when the retainer is once in place, the screw will not fall out.

In both Figs. 10 and 12 the screw retainer is located on the inside of the cover. When the cover is against the mating piece, as shown in Fig. 14, the retainer must be on the outside of the cover. The retainer is of the shape indicated in Fig. 15 and is spot welded in place. The screw has a key-type flanged handle. The flange contact with the retainer is shown as a dot and dash circle. The mating piece is counterdrilled to accommodate the screw threads. A round-shaped retainer formed similar to a horseshoe washer and slightly larger than the handle flange could be used as well as the shape

Fig. 17 — The washer used in this case for retaining purposes is screwed over the threads and into a relief groove so that the washer remains perpendicular to the axis of the screw.



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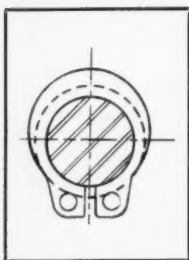


Fig. 18—This sketch shows an external type of retaining ring which can be used with screw-type latches.

shown. The finer the screw threads, the thinner should be the retainer. Swedish spring steel or American blued spring steel from 0.005 to 0.015 inch thick has been used for any of the three retainers shown in Figs. 11, 13, and 15.

Round thin washers of the same material have been used, as shown in Figs. 16 and 17. In Fig. 16, the washer is simply screwed on the threads of the latch screw; however, in this case it will follow the helix

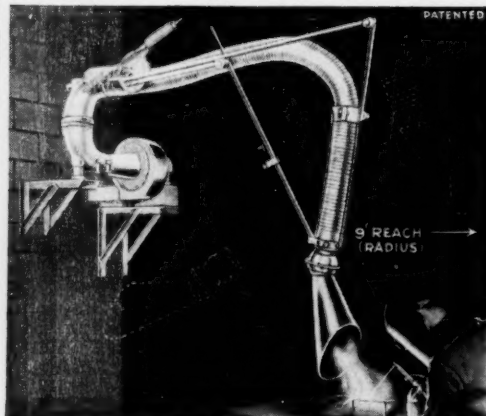
angle of the screw and hit the cover at but one place as shown. The washer shown in Fig. 17 is screwed over the threads and into the relief groove and stays perpendicular to the axis of the screw.

In Fig. 18 a Truarc external retaining ring is spread apart a slight amount, and the screw is threaded through. When the spreading tool is released, the ring hugs the bottom of the groove firmly. The groove is similar



Fig. 19—Sometimes, a hole is drilled through the latch screw and a cotter pin inserted and the ends spread as shown in this sketch.

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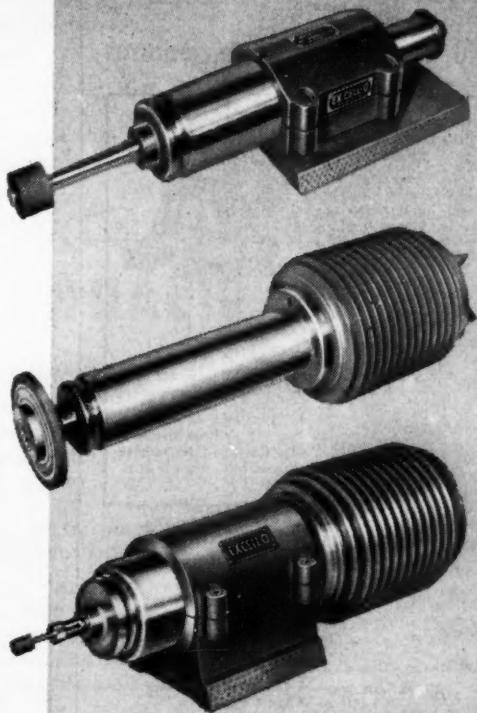
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DETROIT 32, MICHIGAN

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January, 1954

MODERN MACHINE SHOP 167

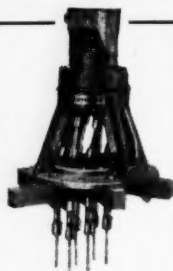
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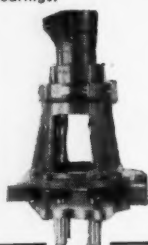
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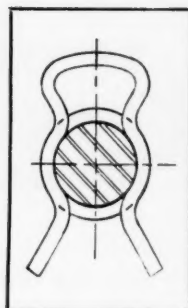
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Fig. 20—The retainer shown in this sketch comprises a formed wire clip which is placed in a groove similar to the one shown in Fig. 17.



to the one shown in Fig. 17.

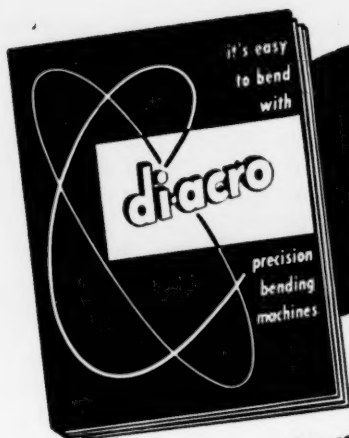
Sometimes a hole is drilled through the screw and a cotter pin inserted and the ends spread as illustrated in Fig. 19. The head and the two ends act as a retainer. In Fig. 20 a formed wire clip is placed in a groove like the one shown in Fig. 17. The head and tails of this wire retainer offer a larger contact surface than does the cotter pin.

If it is found desirable to use other types of screws, those with rolled threads can be used equally as well, if the required type of head can be obtained. The length can be cut to suit. It is not necessary to

Table I—Synthetic Rubber "O" Rings

Outside Diameter in Inches	Inside Diameter in Inches	Size of Round Section in Inches	Dash No.
1/4	1/8	1/16	1
9/32	5/32	1/16	2
5/16	3/16	1/16	3
11/32	7/32	1/16	4
3/8	1/4	1/16	5
7/16	5/16	1/16	6
1/2	3/8	1/16	7
9/16	3/8	3/32	8
5/8	7/16	3/32	9
11/16	1/2	3/32	10
3/4	9/16	3/32	11





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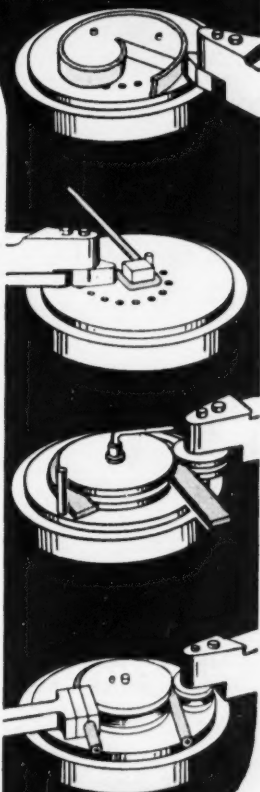
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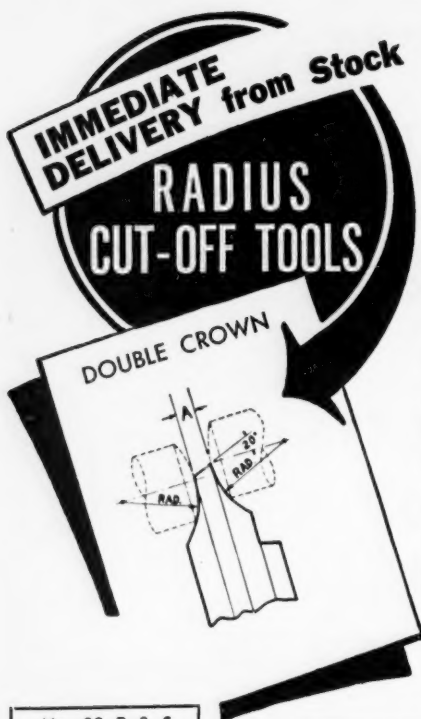
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3/16	7.50
1/4	7.50
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3/8	8.00
7/16	8.25
1/2	8.50

No. 0 B & S	
Rad.	Price
1/4	\$8.50
1/16	8.50
3/8	8.50
7/16	9.00
1/2	9.50
9/16	10.00
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turn down or grind the body or threads for the relief shown in some of the foregoing sketches. Usually the wire used to make these screws is approximately the same diameter as the root of the thread. The head is upset and the threads are rolled to their proper diameter above the original wire diameter.

Standardized "0" rings are available from suppliers' stock, the dimensions and designations of which are given in Table I. The column headed by "Dash No." indicates how these rings are specified and ordered. While many more sizes are available than those listed, only those applicable to screw-type latches in the small sizes have been included.

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.





# NEW

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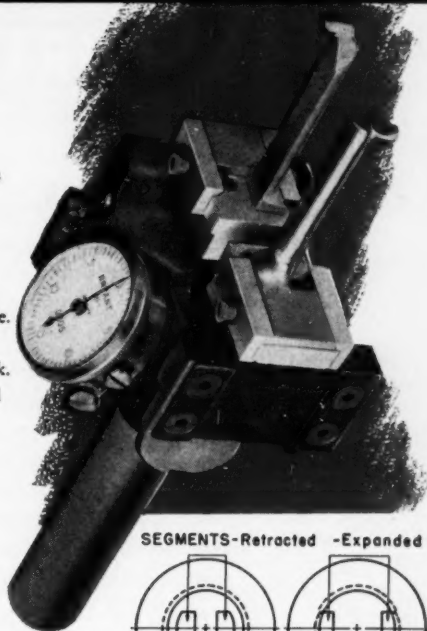
Actual checking of the groove is done by a pair of segments mounted on platforms, one of which is movable. A thumb lever collapses the movable, spring loaded segment so that the gaging members may enter the work. Release of the lever permits the segment caps to expand into the groove. The movable segment actuates a precision dial indicator which shows variation from basic size. An indication of groove roundness is obtained by rotating the work part on the segments, or by rotating the gage in the work.

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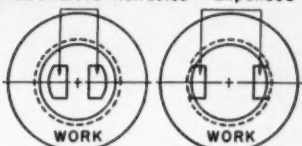
- Four pairs of segments cover standard "O" ring grooves from  $\frac{3}{8}$ " to  $4\frac{1}{2}$ " dia.
- Four pairs of segments cover standard snap ring grooves from  $\frac{1}{4}$ " to  $5\frac{1}{4}$ " dia.
- A single pair of segments may be adjusted over a two inch range, making them applicable to many non-standard grooves.
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- Gage has no slides or pivots.
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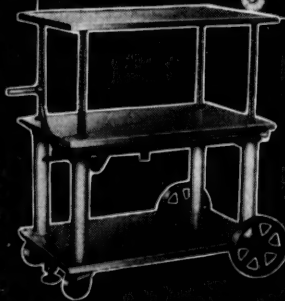
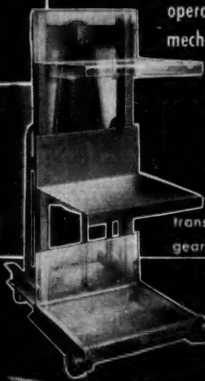
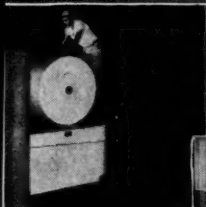
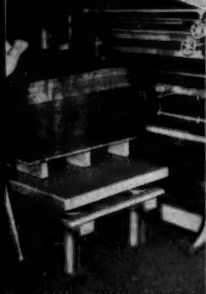
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Spindles have the Pope System of lubrication and are dynamically balanced in full assembly.

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# Manufacturing the Merry Tiller

By EDWARD R. LUCAS

*The various operations performed at the Edmonds, Washington, plant of Merry Manufacturing Company in producing this unique power garden tool are outlined.*

**I**NGENUITY in the application of machine shop techniques to the manufacture of power garden equipment lies behind the postwar burgeoning of one of this country's newest and most rapidly expanding industries. Members of the power gar-

den tool industry foresee an even greater expansion of markets and plants in the very near future. And since their products are made of metal, the production job will be done by the machine shop industry.

The Merry Manufacturing Company of Edmonds, Washington, is one of the newest firms to put its products on the garden supply market. Six years ago its Merry Tillers were being put together at the rate of about 15 units per day in the base-



Merry Tiller assembled and ready for operation. Engine is not made by company. The rotary tines which cultivate the soil and also supply tractive power are spot welded to discs and are unconditionally guaranteed against breakage. Illustration shows the extension rotors attached. Basic unit includes only the two inside discs but extensions widen range of cultivation to 24-inch swath. Chain case assembly connecting pulley drive to rotor drive shaft is clearly shown.



Plant superintendent Bud Allpress holds cutaway chain case assembly.

ment of inventor Clayton B. Merry's home. Today, the Merry Tiller is distributed nationally, and annual production in the new plant into which the firm moved last year is in the thousands. Its rapid and successful growth has been due in considerable part to the adaptation of modern machine shop practices to the production of the Merry Tiller.

The company's head executive personnel includes A. V. Allbery, president, Clayton B. Merry, vice president and general manager, and Carl B. Benson, secretary-treasurer. G. A. (Bud) Allpress is plant superintendent.

Because the Merry Tiller introduced a radically new design that enables the machine to operate as both garden tractor and tiller, some radically new production problems were encountered in setting up the shop and in devising speedy, efficient methods for the different operations. An example of this is the problem of welding the cold roll steel tines to the steel disc to form the tined rotors that are a distinctive feature of the machine. The rotors, operating at a speed of about 100 r.p.m., provide both the forward motion and the tilling action of the tiller, or



the tractive power when used with attachments as a garden tractor. This feature accounts for the extremely light 85-pound weight of the basic machine. The rotors carry an unconditional lifetime guarantee against breakage, so that the welding must of uniformly high quality, as well as fast. This problem was solved through the purchase of a high capacity spot welding machine.

Manufacture of the rotors and the chain case assembly has posed the principal production problem in making the basic machine. There are, in addition, attachments such as the double rotor attachment, sickle bar, mulching rotors, bulldozer blade, lawn motor attachment, and the recently developed "Sno-Fly" for snow removal. The machine is powered by a 2 h.p. Briggs & Stratton gasoline engine.

The problem of making the rotor units was primarily one of speed. Each tine is made of a length of cold roll round stock that is bent in a modified U shape with the ends tapered bluntly. The bending operation is performed satisfactorily by means of a press, the ends being pointed by a shearing operation performed in the same press. Six of these double tines are then welded to the rotor disc. To form one rotor disc unit, therefore, six separate welding operations are required. The job was previously done by arc welding, with a production rate of 10 units per

hour for one man. With the recent acquisition of a Sciaky 250-kva. spot welder, production has been stepped up to two units per minute for one man—an increase of exactly twelve times the previous production rate.

A basic principle of the Merry Tiller is the comparatively slow rate of turning speed of the rotary tines, which, it is claimed, produces better tilling, and enables the machine to be used as a tractor without changing the power transmission reduction ratio. The engine has a maximum speed of 3,200 r.p.m., the recommended working speed being

Illustration showing setup for assembly of chain case. Man at left reams holes in bosses for needle bearing and bushing. Reaming is done vertically and is mostly hidden from this angle. First setup was horizontal and the horizontal reamers are still kept on standby basis and are visible here. Man in center drills oil hole on drill press, and then taps hole with hand electric drill, as shown. Man at right presses in the bushing, the needle bearing, and the double oil seal. When this stage is finished on a batch of cases, the three-man crew then assembles the chains and sprockets and bolts the two halves of the case together, using table at right foreground for bolting operation.



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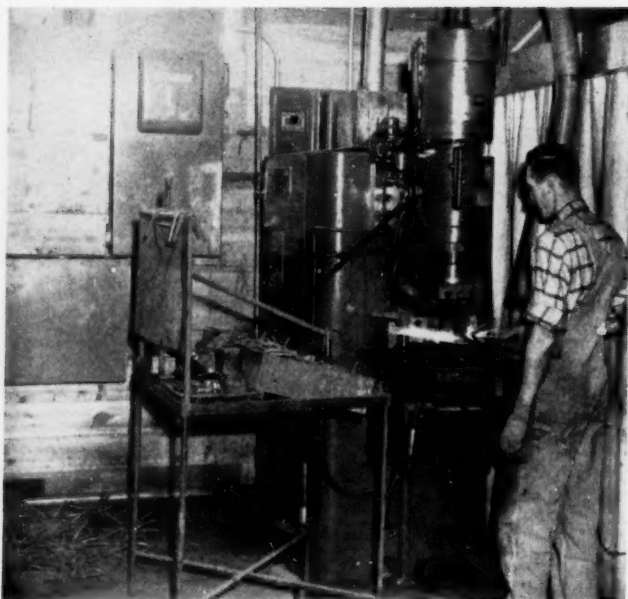


Illustration showing how tines are spot welded to disc for rotor. Pile of welded disc assemblies is shown on floor at left.

2,600 r.p.m. To obtain the desired speed on the tines, a reduction of 29 to 1 is required. This is provided by a chain and sprocket drive inside the chain case assembly. This is one of the central units of the Merry Tiller, and is also manufactured as a complete replacement unit. It was, therefore, necessary to work out a production setup that was fast and performed the job properly.

As laid out, the work is done on a U-shaped bench, set up to perform in sequence the seven principal operations required for the assembly. A three-man crew takes care of the entire job, performing initially five operations on a batch of chain cases and then two operations. The first five operations are performed on the half of the chain case in which the drive shaft and rotor shaft are mounted. This half of the case is de-

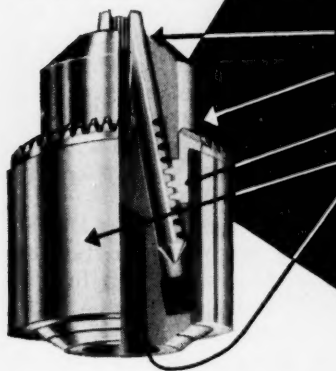
livered to the assembly group with the bosses for the two shafts welded into the stamped sheet metal case and the boss for the rotor shaft counterbored to finish size for the double oil seal. Both bosses must

be reamed to finished sizes, requiring the removal of 0.005 to 0.008 inch from their inside diameters. The sequence of operations is as follows: (1) ream holes for the bushing and needle bearing for the drive and rotor shafts; (2) drill and tap the oil hole; (3) press in the bushing for the drive shaft; (4) press in the needle bearing for the rotor shaft; (5) press in the double oil seal for the rotor shaft; (6) install the sprocket and chain assembly; and (7) assemble the two halves of the case.

The first five operations are performed with one man on operation 1, one man on operation 2, and one man on operations 3, 4, and 5. In the second phase, one man performs operation 6, while two men take care of operation 7.

Horizontal reamers were original-

**Here are the**



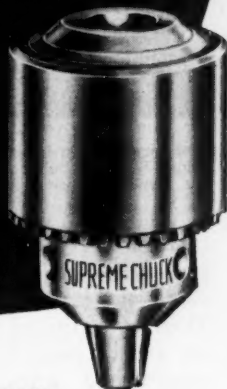
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ly used with operation 1, the work being fed manually into the reamers. This setup is retained on a standby basis. A more efficient and faster arrangement is provided by a vertical reaming fixture that was



Drill press setup for chamfering ends of drive shaft. Shaft drops into box below compressed air actuated vise when chamfering is completed.

made in the shop, with a jig to hold two cases while the two reamers clean out the holes simultaneously. Drilling of the oil hole is performed on a drill press and tapping is accomplished with a hand electric drill, with a suitable holding fixture provided for each operation. Small

compressed air bench presses are used for each of the three press operations. Operation 7 requires two men to only one for operation 6, because 21 of the total 28 bolts and nuts required around the rim of the case must be installed at this point. The other 7 bolts are installed when the case is assembled with the frame and motor mount of the Merry Tiller.

Setting up in this manner accomplishes three purposes. In the first place it enables each man to specialize sufficiently so that he develops his maximum skill and speed. Secondly, there is enough variety that the men do not become bored with their jobs. It would be possible to put a six-man crew onto the job and keep them all on the same operations. Dividing the work in this manner makes it more interesting. Thirdly, tools and materials are prepositioned to the greatest possible extent, making for maximum speed and efficiency.

Merry Manufacturing's machine shop methods differ from the "average" in at least two other respects. First, although the company would be classified as a medium size shop with 45 to 50 mechanics on the payroll, it has been found to be very advantageous to maintain a toolmaking department where virtually all of the firm's special tools are made. One factor here is that because the shop is set up for it, the cost of making one additional tool is never very great. As a consequence, the shop does a good deal of special tooling that would not be done if it had to purchase all of its special tools—a practice that is invariably reflected in lower production costs. Also, since



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Inspection of 9 pieces using conventional plug gage  
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4 pieces passed



4 pieces too small



1 piece  
too large

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### Plug Gage

### Superiority

#### RESULTS of same inspection using DuBo Plug Gage



Of the 4 pieces passed by conventional plug gage above, only 3 are actually within specified limits when inspected with the more sensitive DuBo plug gage.

DuBo reveals piece D (passed above) is too large



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I, rejected by conventional gage as too large, is so verified when inspected with DuBo plug gage.

Of nine pieces inspected, DuBo reclaimed two false rejects and rejected one piece that had been passed by ordinary plug gage inspection. Apply even a fraction of this ratio to a day's production in your own plant and you'll realize the advantage of using DuBo plug gages.

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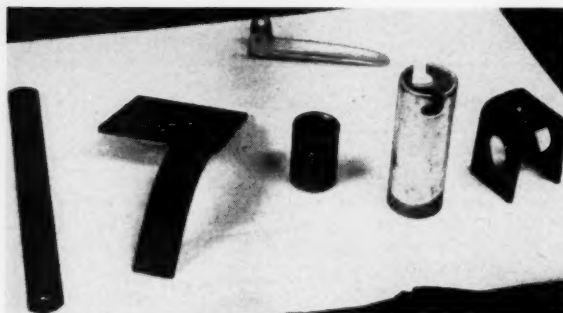
\*U.S. and  
Foreign  
Patents  
Granted

**STANDARD GAGE CO., INC. Poughkeepsie, N.Y.**

the appearance of the tool is unimportant, some of the finer points of finishing that a toolmaking firm must observe may be ignored, thus reducing the cost still further.

Secondly, the shop makes unusually wide application of press operations; and since punching or shearing was found to be faster than

the use of a broach in a punch press. This arrangement was satisfactory for the parts, but it was discovered that too frequent replacement of the costly broach made the operation too expensive. Now, the edge is put on the 3/16-inch thick steel blade by a simple shearing operation in a punch press. The blades are bent in



Some of the parts which are made by punch press operations: (left to right) handle cross brace; mulching hub with one of four blades riveted to it; basic rotor tube; extension rotor tube; hitch; and, in back, clutch handle.

cutting, production processes are speeded up accordingly. The shop's ability to make its own tools is a factor here as well, since virtually every punch operation that is at all unusual requires a special tool.

A good example of an unusual punch press operation is the method used to make the curved blades for the mulching rotor attachment. Four of these blades are required for one mulching hub, and it is important that they be turned out speedily and of good quality.

Two operations are required on each blade: (1) putting the edge on the blade and (2) forming it. At first, the edge was made by grinding, but it was found that the grinding process made some of the blades brittle enough so that they broke when formed in the punch press. The second method attempted involved

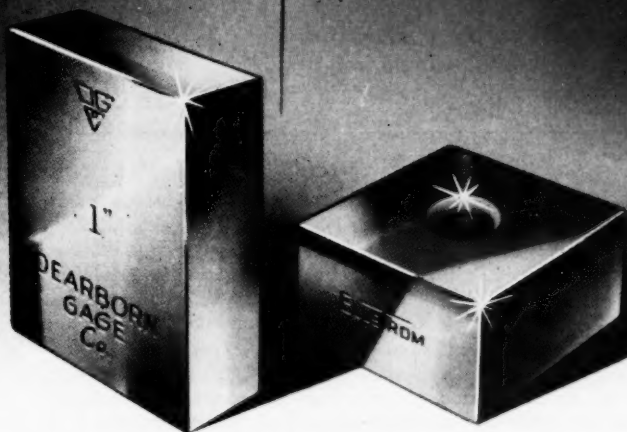
the same press in a forming die for the second operation.

Punch presses have also been used to punch holes or similar small openings in steel tubing such as the lengths of tubing used for the basic rotor hub, the extension rotor hub, and the clutch handle. The shop, again, made its own fixtures for these operations. Press equipment in the shop includes a 15-ton Press-Rite press, a Bliss 30-ton press, a 50-ton Walsh press, and one 10-ton press.

Ingenuity has gone into other shop operations such as the method devised for chamfering the ends of the Merry Tiller drive shaft. For this, a chamfering cutter was designed for use in a drill press. A vise with a compressed air actuated jaw holds the shaft while the operator chamfers the end with the cutter

# Ellstrom

*measuring in millionths for three generations*



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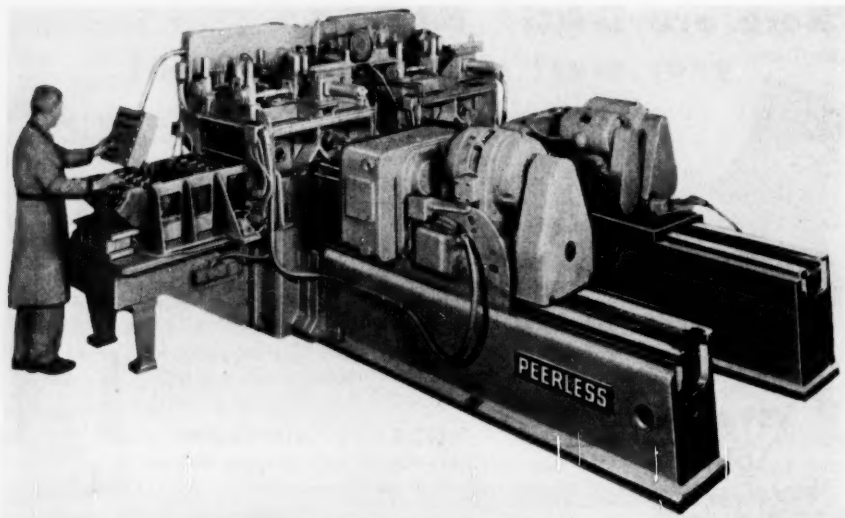
which is chucked in the drill press. The vise jaw is controlled by the operator by means of a foot switch. The setup enables the operator to do the job with speed and accuracy.

Two other methods save time and money for Merry Manufacturing. One is the paint dipping rather than spraying of parts. The other is the shipping of Merry Tillers "knocked down" to distributors. This arrangement now enables the company to load more units into a single freight car than was previously possible.

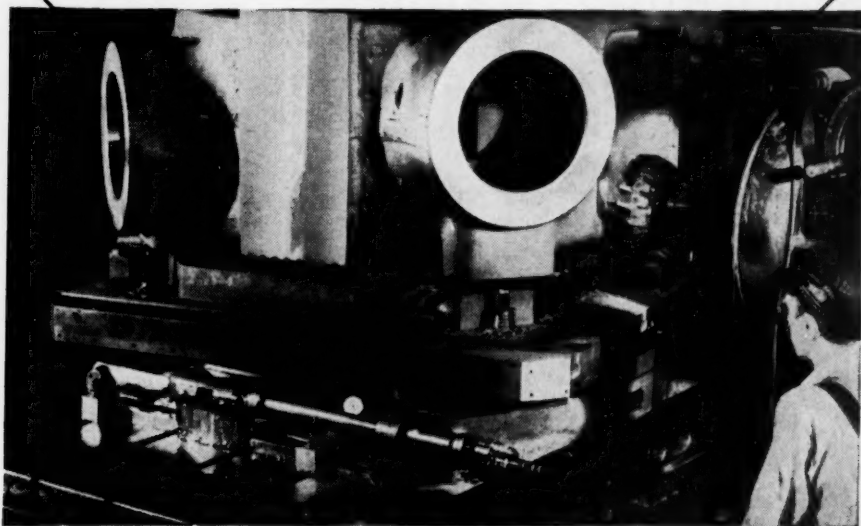
For further information on any product mentioned in this issue—use the **READER SERVICE CARDS** between the covers.

### Machine for Drilling and Boring Camshaft Bearings

**O**NE of the world's largest automobile companies is now using the Peerless Horizontal Transfer Machine illustrated herewith in the manufacture of V-8 cylinder blocks. This two-station hydraulic-feed specialized production equipment is used for core drilling and semi-finish boring camshaft bearings, as well as for drilling various other holes in both ends of cylinder blocks. The machine produces 75 blocks an hour at 100 per cent efficiency. Designed and built by Peerless Production Co., Detroit, Mich., the machine utilizes unitized transfer sections and hydraulic feed units. Other typical features include fixed-center ball-bearing heads with oil circulating pump for lubrication, hardened and ground way-type units with automatic lubrication, and electrical and hydraulic installations to J.I.C. standards.



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Illustration shows combination plain and hand feed Rotary Table that may be turned rapidly by hand to approximate position. Fine adjustments are made with hand crank. Other round or square sizes are available up to and including the 60" x 96" rectangular platens. Close-limit machining is made possible by table graduations to  $1/2^\circ$ ,

handy indexing stops, and dial indicator, accurate to .001".

For all the information on G&L Rotary Tables for all types of horizontal boring, drilling and milling machines — write direct or contact your nearest G&L Distributor for bulletin A-20.

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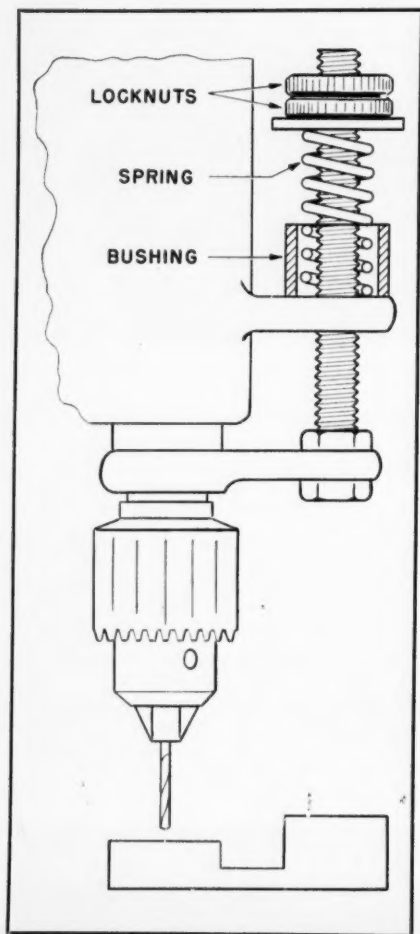
## GIDDINGS & LEWIS MACHINE TOOL CO.

Fond du Lac, Wisconsin

# Case History No. 11

## Machining Stainless Steel

By G. J. STEVENS\*



### Problem

A drill press operator was burning up drills and sometimes fracturing them on the break-through when drilling stainless steel. This is not an uncommon experience when the operator lacks the right touch; however, it can be easily remedied.

### Solution

A simple means for controlling feed and obtaining longer, more productive life from drills was afforded by the home-made spring stop mechanism shown in the accompanying sketch. The length of the spring is determined by the depth of the hole. The bushing should permit easy action of the spring.

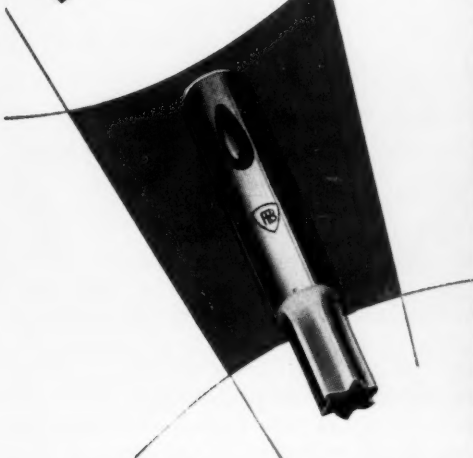
### Another Feature

The spring stop mechanism also works well in deep-drilling stainless steels. In such instances, the operator must withdraw the drill at intervals to remove the chips. Using this device when the operator re-enters the drill, the spring compresses and places the drill in a feeding position. Thus, the drill cuts instead of riding the work and prevents work-hardening the part and burning up the drill.

\* Machining Engineer, Armco Steel Corp.



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# Shearing Machine Guards Increase Efficiency

By F. E. RILEY

*Operators are protected in cutting sheet metal pieces by a blade guard at the machine front and a mechanical piece-removing arrangement at the rear.*

IT IS often thought that effective safeguarding of machines can be obtained only by sacrificing some operating efficiency. In the case of one firm operating several shearing machines for the cutting of electric motor lamination metal, the need for more efficient guarding led to the fitting of devices to each machine which increased efficiency by removing mechanically the pieces cut by

the blade of the machine.

It was discovered that many accidents occurred when work was fed from the back of the shearing machine. Although the machine was designed for operation from the front, it was found, on repetition work to fine limits, that one operator fed sheets from the back of the machine to a front stop, the cut pieces being removed by a second operator at the machine front. This two-man working can be particularly hazardous since the operator at the rear may be out of sight of the front oper-

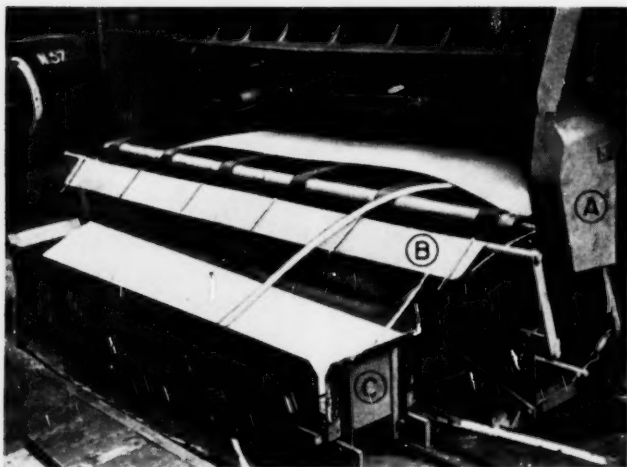
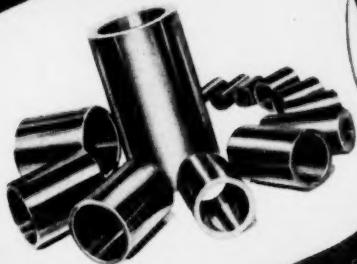


Fig. 1—Rear view of shearing machine, showing simple belt conveyor for conveying cut pieces away from the shear blade and onto a guide plate which directs the pieces into a special truck.

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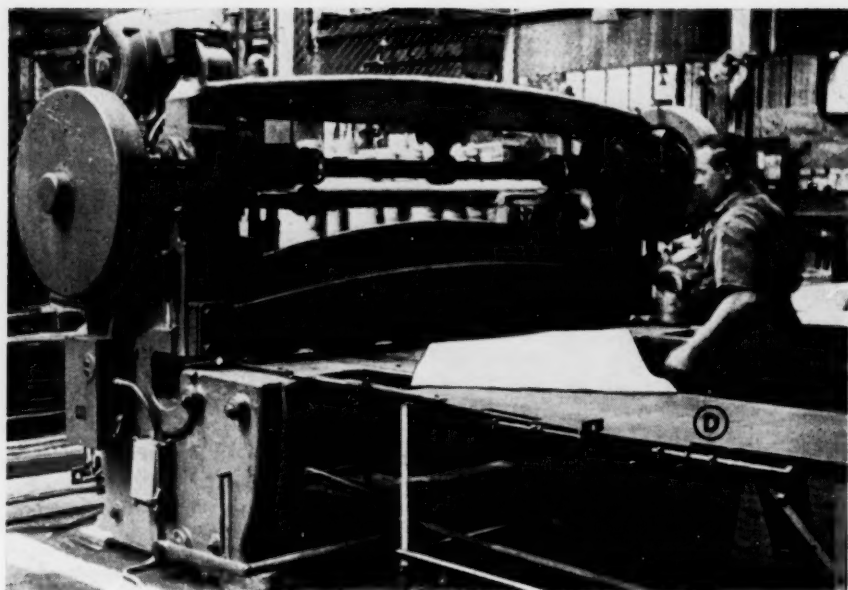


Fig. 2—Front view of shearing machine. A wire mesh guard (not readily visible) is bolted in front of the blade in such a manner that sufficient space is provided beneath it to allow buckled sheets to pass through the machine yet the operator's fingers are prevented from getting under the blade.

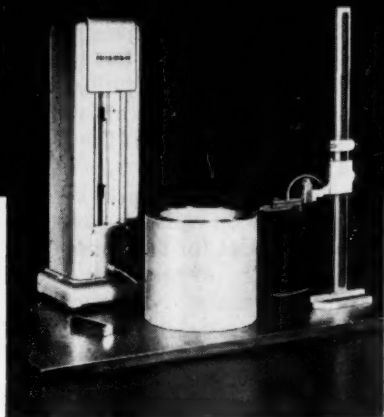
ator when handling work close to the blade. Inadvertent engagement of the clutch by the front operator can result in a serious accident. Although the rear worker may only be collecting cut pieces and trimmings from the back of the machine, there is always the hazard that he may stumble against the blade the instant it is set in motion.

A method devised for increasing the efficiency and safety of the shearing machine is shown in the accompanying illustrations. The arrangement dispenses with the need for a second operator. If the single operator goes to the back of the machine for any reason, he cannot get near the blade. In fact, no person can ap-

proach the rear of the blade, since the space between the end frames is filled by a simple belt conveyor, as shown in Fig. 1. The conveyor comprises six endless belts running on a pair of rollers which is revolved by a belt connection with the backshaft of the machine. The belt drive is housed within the casing *A* in Fig. 1. As the cut pieces are severed by the machine blade, they drop onto the belts of the conveyor which carry them along until they fall off the outer roller. A narrow chute or guide plate, *B*, is positioned adjacent to the roller so that the pieces are directed into a special truck. The guide plate *B* has round steel rods welded to its upper surface to reduce the

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tendency of the sheet metal pieces to cling thereto. The guide plate is adjustable for position to suit the various strip sizes cut on the machine.

It will be noted from Fig. 1 that scrap is also carried away from the blade by the conveyor and, although this interferes sometimes with the stacking of the pieces in the truck, no serious trouble arises. It is considered better to convey mechanically the scrap away from the blade than to rely on workmen pulling it out of the machine and taking risks.

The truck into which the cut pieces are deposited is specially made to suit the material sizes being cut and operates on rails made from angle-iron material for easy conveyance to a punch press which cuts discs from the strips. No handling

is necessary between shearing machine blade and punch press as the pieces stack themselves automatically in the truck, apart from the need for occasional clearance of scrap strips when they interfere with the stacking process. Access to the stack of material in the truck is obtained by lowering the hinged end plate C which swivels on two bolts.

Figure 2 shows a front view of the shearing machine. Front stops are provided at the edge of the extension table D whose top surface is flush with the platform of the machine. The table extends for less than half the machine width, a feature which allows the operator to stand centrally in front of the machine but permits large sheets of material to be manipulated single-handedly in the manner shown. The front



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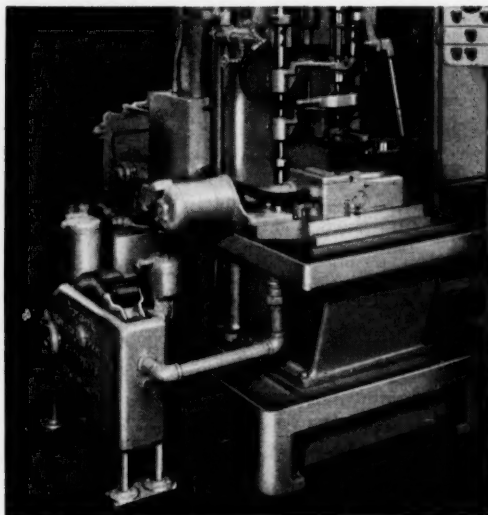
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Philadelphia 33, Pa.

of the shear blade is provided with an additional guard made from wire mesh. This guard is bolted in place, and the space under it allows buckled sheets to pass through but is less than the thickness of the average finger.

### Tap Film

Threadwell Tap & Die Co., Greenfield, Mass., has produced a 15-minute sound slide film entitled "Taps and Tap Terms," which is available for group showing. The film contains no advertising and is designed to explain in simple straight-forward language the kinds of taps, including the terms applied to various parts of a tap. This fundamental and basic information should prove of great interest and value to users of taps. At the present time, showings are being conducted by Threadwell representatives and distributors as a public service. Arrangements for showings of the film before groups can be made by writing to the company.



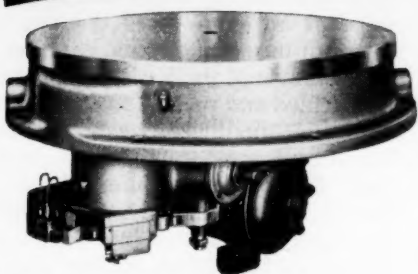
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# Centralizing Gage for Setting Work to Milling Cutters

By W. M. HALLIDAY

*The gage described has been found particularly useful in toolroom work involving the milling of a variety of workpieces.*

A SIMPLE quick-acting centralizing gage of the design shown in the accompanying sketch has been found by the writer to be particularly useful and time-saving in toolroom work involving the milling of a variety of workpieces. The gage is adapted for mounting directly on the particular milling cutter selected while the cutter is positioned on the milling machine arbor. When the gage is properly mounted, an integral hardened pointer automatically indicates the exact center of the width of the cutter, with the pointer being subsequently used for checking against the scribed lines in the workpiece. Alternatively, the pointer may be employed for scribing center lines, and so on, on the workpiece, provided the latter is traversed in a suitable manner past the pointer.

The gage, which is constructed so as to have ample capacity for efficiently mounting on cutters of different diameters, widths, and tooth formation, includes a hardened and ground steel block, *A*, having a

standard 90-degree V-slot, *B*, machined centrally in one side. The front edges, *C*, of this V-slot are beveled at an angle of 45 degrees to the front face of the block, as shown. At each side of the V-slot, the block *A* is drilled and reamed to accommodate the shouldered ends of two hardened steel cylindrical guide rods, *D*, of identical diameter and overall length. These rods, which are tightly press-fitted into the block *A*, are turned down on the upper ends to provide positive locating shoulders and bearing surfaces for a drilled support plate, *E*, the holes in the plate being situated at exactly the same center distance apart as those in the block *A*. The plate *E* is retained by a nut, *F*, screwed onto the threaded end of each rod.

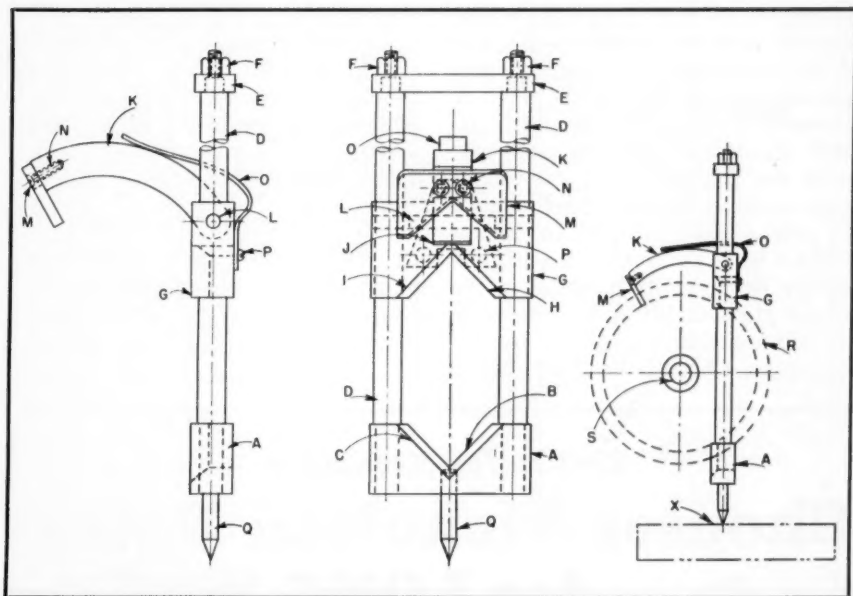
A second hardened steel block, *G*, somewhat wider than the block *A*, is mounted so as to have a close-sliding fit on the guide bars *D*. The block *G* has a V-slot, *H*, machined completely across its underside, the center of this slot being in line with that of the V-slot *B* in the block *A*. The size

and angle of slot *H* are also identical with those of the matching V-slot in the block *A*. The front edges of the slot are beveled at an angle of 45 degrees, as indicated at *I*.

Provided in the top surface of the block *G* and located centrally with

slots *B* and *H*. The arm *K* has a considerable amount of swiveling movement relative to block *G*; namely, a 35-degree movement each side of the horizontal center line passing through the pin *L*.

A leaf spring, *O*, is fastened to the



Sketch of simple quick-acting centralizing gage for setting work to milling cutters

the V-slot *H* is an open end parallel slot, *J*, into which is closely fitted one end of a curved arm, *K*. This arm is arranged to pivot on a stationary pin, *L*, driven firmly into a horizontal hole passing through the slotted portion of the block *G*. To the opposite end of the arm *K* is permanently fastened a thin mild steel plate, *M*, which is secured in place by two V-head screws, *N*. At one side, the plate *M* has a 90-degree V-slot of exactly the same size as

rear vertical side of block *G* by screws, *P*, with its free end bearing upon the top of the arm *K*. The arm *K* is curved a substantial amount to provide adequate clearance between the arm and the periphery of the milling cutter, *R*, when adjusting the V-slotted plate *M* into close engagement with the periphery of the cutter. A hardened cast steel pointer, *Q*, is fastened in the base of the block *A* so as to lie exactly on the center line of the V-slot *B* and perpendi-

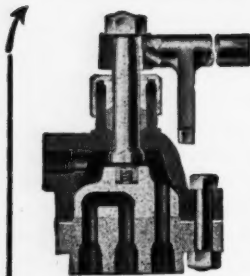
cular to the base of the block.

In use, the gage is mounted with the cutter *R* inserted between the two parallel guide rods *D*, which are situated well to the side of the milling machine arbor, *S*. The upper V-block *G* is adjusted along the guide rods so that the cutter is firmly held between the V-slots *B* and *H*. Actual contact with the curved periphery of the cutter is established by the beveled sides of the V-slots. Arm *K* is swung through the vertical plane until the V-slot plate *M* also contacts the periphery of the cutter some distance behind the block *G*. As soon as this third V-slot makes contact with the cutter, the gage is rigidly held against turning in the lateral plane or lifting from the cutter. The pressure imposed by the leaf spring *O* holds the V-slot plate

*M* firmly in contact with the cutter. With the gage thus mounted, the pointer *Q* lies exactly on the center line of the cutter width. Scribed center lines or outline marks on the workpiece *X* may then be set to coincide with the pointer so as to bring the workpiece into the correct machining position. If desired, a small locking screw may be threaded into a hole provided in one side wall of the block *G* for bearing against one of the guide rods *D* so that the block, and so on, may be locked in any given setting on a cutter.

For further information on any product mentioned in this issue—use the **READER SERVICE CARDS** between the covers.

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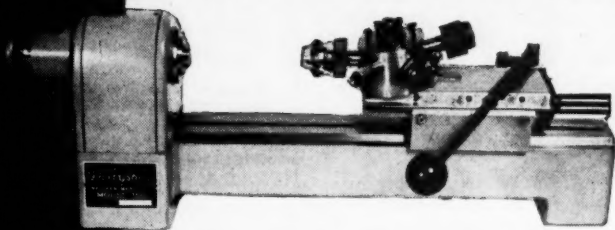


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Overall Length  
With Lever Chuck Closer 25"

Length of Bed .....22"

Height to Top of Headstock 8½"

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Width of Ways .....1-13/16"

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Distance between Centers.....12"

Center Height .....2.953" (7.50 cm)

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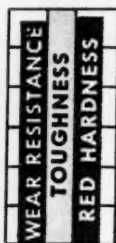
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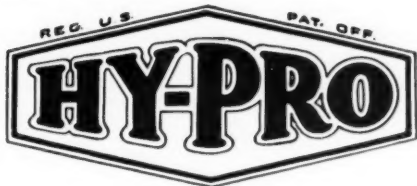
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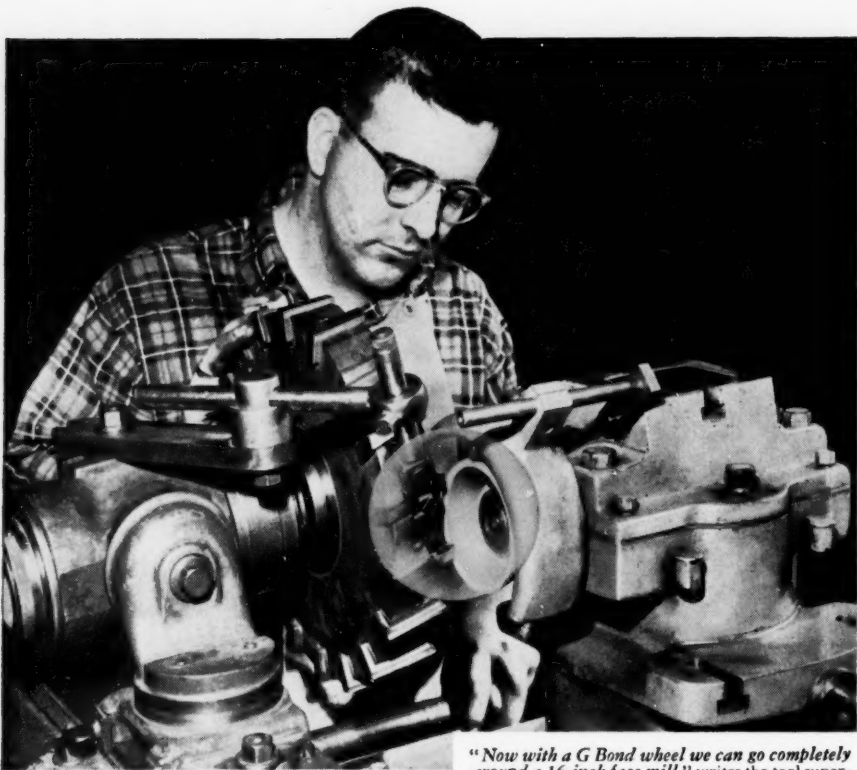
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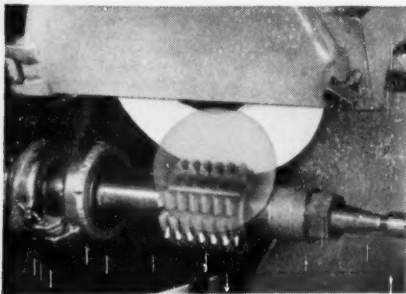
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### *What users say about New G Bond Wheels*

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**"Heavier feeds without burn."**

**"Run absolutely true."**

**"No breakdown — no jagged edges."**

**"Cut freely, hold shape with no burning."**

**"They show how a real wheel will cut."**

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will take heavier cuts in expensive, heat-sensitive steels without drawing temper. They'll reduce tool spoilage, give you closer tolerances and smoother finishes than you ever got before — with fewer wheel changes and machine adjustments . . . Those are the value-adding, money-saving "Touch of Gold" advantages that make G Bond wheels outperform any others you ever used.

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can recommend the right G Bond wheels for your jobs. Contact him or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your classified 'phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

W-1531

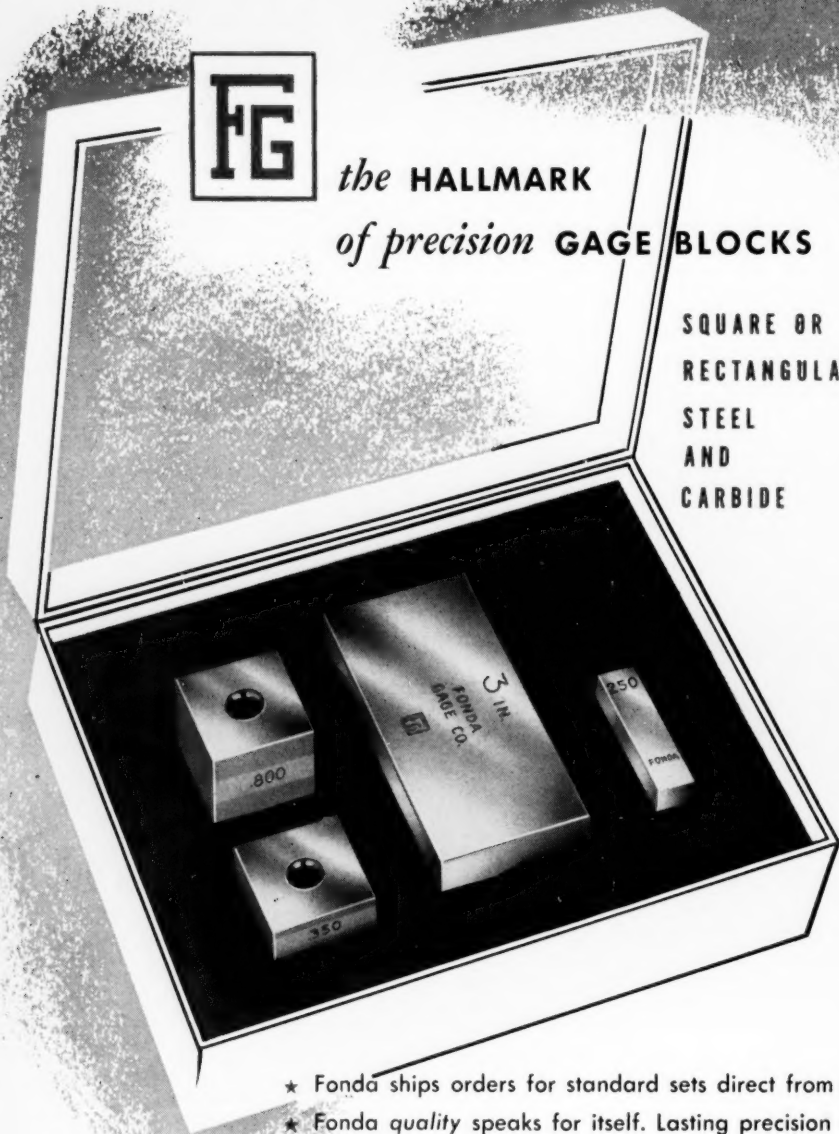


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## Important Meeting Dates

### January 14

Regional Meeting of Southern Industrial Distributors' Association and American Supply & Machinery Manufacturers' Association, Edgewater Gulf Hotel, Biloxi, Mississippi.

### January 18-22

American Institute of Electrical Engineers: Winter general meeting, Statler Hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

### January 21-22

National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

### January 25-28

Plant Maintenance & Engineering Show, produced by Clapp & Poliak, Inc., International Amphitheatre, Chicago.

### April 26-30

American Society of Tool Engineers Annual Meeting and Industrial Exposition, Philadelphia.

### May 4-7

National Spring Meeting of the American Welding Society, Hotel Statler, Buffalo, New York.

### May 5-8

Welding and Allied Industry Exposition, Buffalo Memorial Auditorium, Buffalo, New York.

### May 8-14

Biennial Foundry Exhibit, sponsored by the American Foundrymen's Society, Cleveland Public Auditorium.



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# modern equipment at work

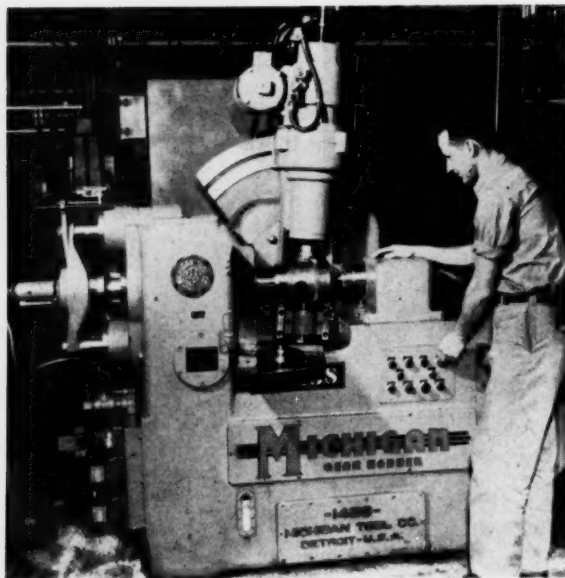
## Hobbing Aircraft Spur Gears

**A**T Pratt & Whitney Aircraft, Division of United Aircraft Corporation, East Hartford, Conn., moderate length runs of aircraft spur gears are produced on an Ultra-Speed hobber built by Michigan Tool Company, Detroit. Tooling on this installation per-

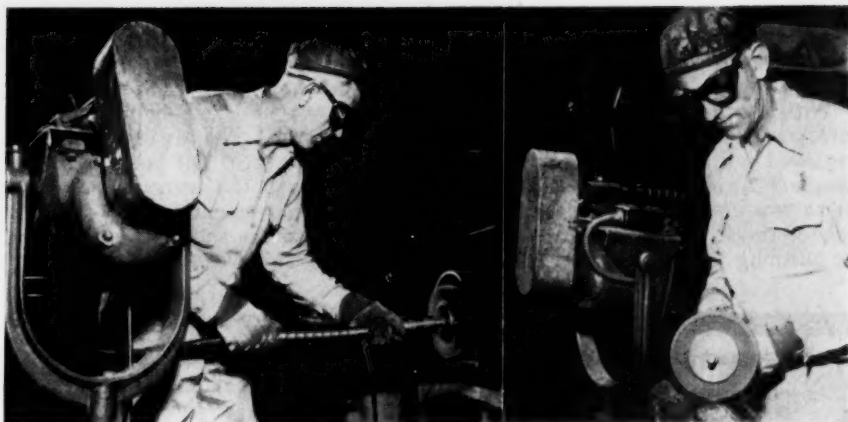
mits Pratt & Whitney Aircraft to take advantage of the machine's high operating rate and still enables the machine to be used efficiently for moderate volume hobbing.

Actual production rate is classified, but it does not take too long to handle some of the runs on aircraft gears. A variety of spur gears within the Ultra-Speed's work range can be hobbled;

however, to attain maximum efficiency, change-over time must be held to a minimum. To make a change from one spur gear to another of different diametral pitch and number of teeth, all that is required is the removal of the hob and the replacing of the proper ratio gears, and the removal and replacing of the hob speed gears, if neces-



Hobbing rear timing gear teeth for Pratt & Whitney Aircraft Wasp Major machine. Two AMS 6260 steel forgings are hobbled at one time (two blanks back to back) in Michigan Ultra-Speed hobber.



(Left) Wire brushing inside of brazed tube seam. (Right) Grinding brazed seam.

sary. The fixtures are then taken off and replaced with the next set; all this requires is the removal and replacing of four bolts each on the headstock and tailstock. Spacers on the yoke ends are changed if it is necessary to change the relation of the gear to the hob. All that remains is for the operator to adjust the infeed, set the cross-feed limit switches, and check the depth of cut.

Change-over time is approximately 45 minutes. This could be reduced slightly on small parts by mounting the parts on an arbor. If the arbors are properly designed, all that is necessary is the changing of the hob, the ratio gears, and possibly the hob speed gears.

### Grinding and Wire Brushing Brazed Tube Seams

**B**RAZING the seams of freon receivers at the Governair Corp., Oklahoma City, Okla., is a delicate job since each seam must be completely free from leaks. Before brazing, the connection is "veed" out using a Macklin's A16R8B5 grinding wheel operat-

ed at a speed of 3,450 r.p.m. by means of a Stow Multi-Speed flexible shaft machine. After brazing, the seam is ground and wire brushed both inside and outside at a speed of 3,450 r.p.m., as shown in the accompanying illustration.

According to Governair officials, reduced operator fatigue and doubled output of freon receivers are advantages gained through the use of the flexible shaft equipment.

### Fire Hazard Eliminated in Removing Cutting Compounds from Files

**A** large manufacturer of files has eliminated a very serious fire and explosion hazard as a result of a newly adopted method of removing cutting compounds from files after machining. The files were formerly cleaned by soaking in a still tank containing a highly flammable solvent. There was a constant danger of fire or explosion, and the fumes made the cleaning operation unpleasant. Lard oil and chalk had to be removed in the clean-

ing job and, with the particular solvent used, considerable hand brushing was required in order to obtain any satisfactory degree of cleaning.

With the newly adopted method of cleaning files, the volatile solvent was replaced with a diphasic emulsion of Magnus 741 made up of one part cleaner to two parts water. This emulsion, heated to 160 deg. F., did a much faster cleaning job when tested in a steel

tank. However, it was desired to eliminate hand work. Files from a soak in the 741 emulsion steel required some hand brushing. Accordingly, a small Magnus Aja-Dip cleaning machine was installed into which the diphasic emulsion was charged. The positive scouring action of the solution resulting from the movement of the files up and down in the solution many times a minute ensures the removal of

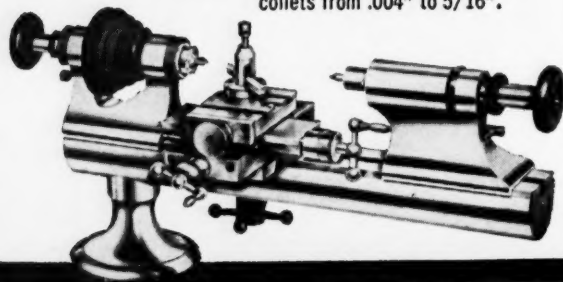
loosened oil and chalk from all parts of the files.

Cleaning costs, it is claimed, have been materially reduced, not only because of the elimination of hand work, but because of the unusually long life of the 741 cleaning solution. It is further stated that the fire and explosion hazard has been completely ended and due to the light protective film of solvent left on the files after they are taken from the Aja-Dip machine, rusting, which used to be a cause of trouble, has also been eliminated. Completely cleaned files are obtained in a period of less than five minutes from charging to removal from the machine.

## SMALL INSTRUMENT PARTS ARE MADE BEST ON *LEVIN* LATHES



Twenty-three models for all types of work. 4" swing,  
Bed Length 12" or 18"; over 100 stock sizes of  
collets from .004" to 5/16".



Send for Catalog L describing Lathes for tool work,  
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LOUIS LEVIN & SON, INC., 782 E. PICO BLVD., LOS ANGELES 21, CALIF.



The P. D. Q. (Portage Double Quick) tool holder and adapter line opens a new era in quick change tools. These Portage tools not only mean new speeds in production and set-up time, but increased accuracy as well.

*Send for the New P. D. Q. Catalog*

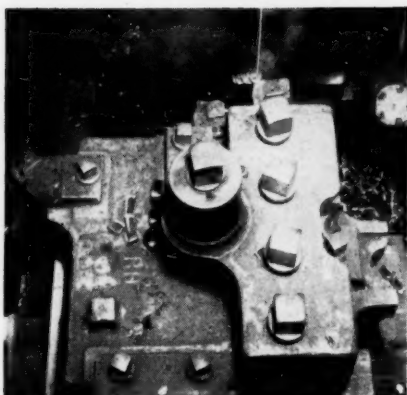


**PORTAGE Double-Quick TOOL CO.**

1041 Sweitzer Avenue • Akron 11, Ohio

## Clamped Carbide Insert Tools Boost Production of Mounted Railroad Wheels

**B**Y the use of tungsten carbide tooling, Diesel and car wheel sets are machined in approximately 18 minutes floor-to-floor time at the Citico Wheel Shop of the Southern Railway System, Chattanooga, Tennessee. Op-



Diesel and car wheel sets are machined in approximately 18 minutes floor-to-floor time using three carbide insert tools in each turret of a double-end lathe equipped with hydraulic feed and profiling attachment. Tools remove rollover, cut down high portion, profile, and machine inner side of flange.



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• COLLIS Taper Tools are made by men skilled in this type of manufacture. Users get long satisfactory service from COLLIS Equipment and find the answer to all drilling, reaming, and tapping needs in the COLLIS line. We can give prompt service on orders for Lathe Centers, Arbors, Drill Drifts, and Magic Type Chucks as well as on Sleeves and Sockets and Collets.

**THE COLLIS CO.**  
DEPT. A, CLINTON, IOWA

erations are performed with Kennametal clamped tools on a Niles 52-inch car wheel lathe equipped with hydraulic feed and a profiling attachment. This rugged 100-h.p. lathe has double-end chucking, drive, and tooling.

Three clamped insert tools are used in each turret. Tool No. 1 removes excessive mushroom or rollover on the outside of the flange. Tool No. 2 removes the high portion of the flange while one insert of tool No. 3 is pro-

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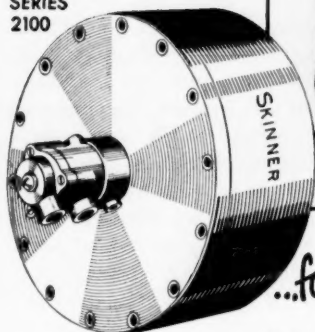
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9" to 36" Swing  
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**MASTER-TAPER COMPANY**  
4531 N. Beacon St., Chicago 40  
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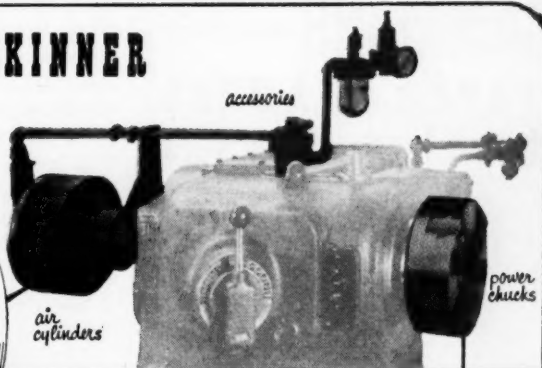
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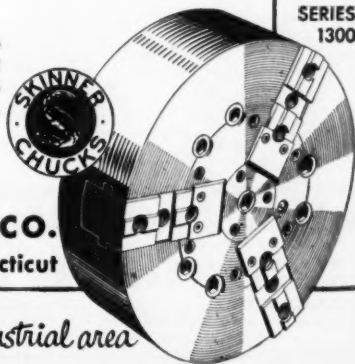
Skinner Chucks are available from 6" to 21" with forged steel bodies, and with either 2 or 3 adjustable or non-adjustable jaws. Exclusive sliding wedge construction grips internal or external work positively, and will not release the work, even if air line is broken, until operator actuates draw bar. Double-acting rotating (Series 2100 for speeds up to 1500 R.P.M.) and non-rotating air cylinders are available with semi-steel bodies for all sizes of power chucks, holding fixtures and tailstocks. Series 2200 double-acting rotating air cylinders have aluminum bodies for operation up to 3000 spindle R.P.M. Skinner accessories include hand-operating valves—complete air unit—filters—soft blank top jaws; draw bars—draw tubes, etc.

*Write for catalog on the Skinner line of power and manually operated chucks. And ask about movie, "Chucks and Their Uses"—available for free showings.*

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for all types of die work



- Specially treated for modern die steels.
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Manufacturers of helical taper pin, chucking,  
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fling the tread. This insert profiles from the outside radius across the tread and up to the top of the flange. The inner side of the flange is next machined with the other insert to complete the wheel. The cutting edge of tool No. 1 has a 0.030-inch wide x 5-degree negative land. Tools Nos. 2 and 3 have parallel chip breakers  $\frac{1}{4}$  inch wide x 0.020-0.025 inch deep. Before tools are put into service, the operator hones the cutting edges to approximately a 0.005-inch radius.

The operation of each turret is independently controlled. The operator staggers the cutting period of each turret to minimize peak power load. The amount of power consumed is indicated on an ammeter in full view of the operator. Longitudinal and cross movements are controlled hydraulically to maintain constant feed along the machined surface.

The amount of stock removal is determined by a flange gage and by the tape size of the wheel as specified by the American Association of Railroads. Left and right tracer styluses are then set with a measuring rod graduated in tape size to assure uniform wheel size.

Freight and passenger car wheel sets of 33 and 36-inch diameters are machined at 0.082 to 0.086-inch feed, 12 r.p.m., and  $\frac{1}{8}$  to  $\frac{3}{8}$ -inch depth of cut (average,  $\frac{1}{4}$  inch). Profiling time is about 8 minutes for freight car wheels and 8 minutes for passenger car wheels. Mounted 40-inch Diesel wheel sets (hardness at rollover of 300 to 400 Brinell) are profiled (reworked to original form) with 0.072 to 0.085-inch feed in approximately 10 $\frac{1}{4}$  minutes at 9 r.p.m. The depth of cut is the same as noted above for freight and passenger car wheel sets.

# TREET-ALL

the  
**HEVI DUTY**

*Multi Purpose*

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The alloy muffle and gasketed door form a tight seal which simplifies atmosphere control. The furnace, quench tank, cabinet and controls form a compact, completely wired unit.

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HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY,

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

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*Blade*

NOT THE  
*Machine*

THAT DOES THE  
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## Air Units Speed Spark Plug Assembling

**A**CCORDING to information released by Mead Specialties Co., Dept. LS-42, 4114 N. Knox Ave., Chicago 41, Ill., a unique combination of electrical and pneumatic devices drives home the locking nut on Duchess spark splugs with a minimum of time and effort.

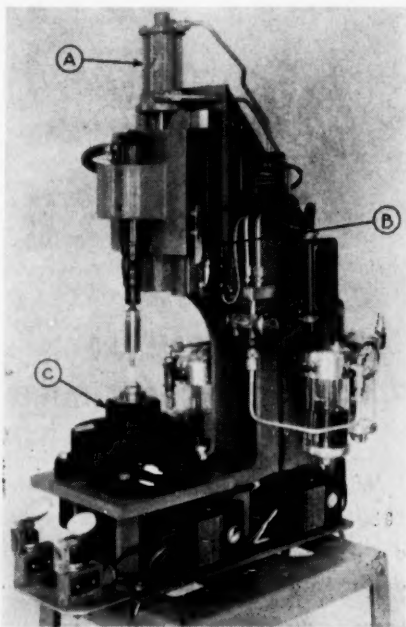
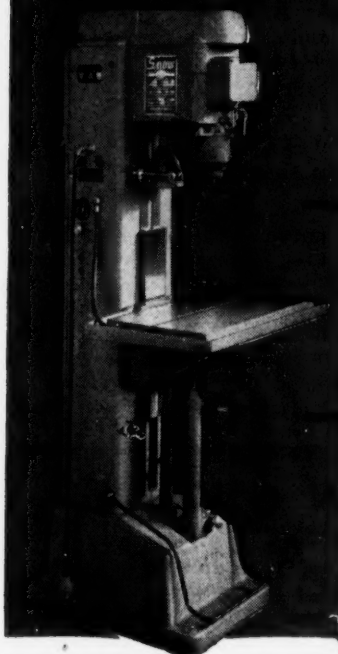


Illustration showing electrical and pneumatic device setup used in assembling spark plugs

The machine used for this job was designed and built by Crusota Engineering Co., Springfield, Mo., using a number of standard Mead air-operated units.

Referring to the accompanying illustration, the sequence of operation of the machine is as follows: A spark plug is placed in an LS-1 collet fixture (C), and the main air valve is opened to supply collet pressure. A micro-

*For Top  
Production*



Snow air operated—electrically controlled machines have built in full universal controls that allow selection of the type of spindle cycle desired. This feature also permits instant synchronization of the standard Snow Master Fixtures. All types of air operated automatic and semi-automatic jigs and fixtures are carried in stock. Standardization permits low cost tooling—and—high production. Sensitivity of power application prevents tool breakage.

Simplicity of control means that set up and operation can be handled by a less experienced operator with minimum fatigue.

**Submit Sample Parts for Production & Cost Estimates**

# SNOW

## FULL UNIVERSAL MACHINES

Air operated, electrically controlled Snow tools are establishing amazing production records daily on a wide variety of work. Just note these typical examples:

### DRILLING

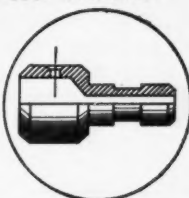
Cross Drill and C" T" Sink 1/16" Hole

Material—Brass

Production—4800 per hour

Fixture—# 15 Vertical index

Equipment—# 1-UD Drilling Machine



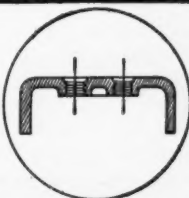
### TAPPING

Tap Two #10-32 Holes

Material—Steel stamping  
Production—3800 tapped holes per hour

Fixture—# 14 horizontal index

Equipment—# 1-UT tapping machine



### THREADING

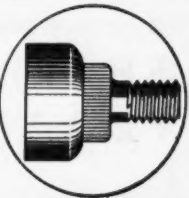
3/8"—24 Thread—1/2" Long

Material—Die Cast Aluminum

Production—2500 per hour

Fixture—# 10 Drum dial

Equipment—# 3-TR Threading machine



# SNOW

**MANUFACTURING COMPANY**

435 Eastern Ave., Bellwood, Illinois  
(Chicago Suburb)

Single Spindle Verticals • Two-Spindle Verticals • Two-Spindle Horizontals • Automatic Nut Tapping Machines • Drill Press Tap Heads • Automatic & Semi-Automatic Jigs & Fixtures

switch on the left is depressed to provide momentary contact and shift a four-way double solenoid valve. A double-acting F-1.75-S cylinder (A) moves the dovetail slide, carrying the nut setter toward the plug. Prior to setter socket engagement over the hex nut of the plug, a cam finger (B) attached to the dovetail slide trips a micro-switch roller, energizing a two-way solenoid supplying air to the nut setter. Tripping of this micro-switch also starts the timer motor.

The setter socket is controlled by a built-in clutch. A timer is adjusted to allow sufficient air to the setter to throw the clutch. The solenoid controlling setter air is then reversed by the timer, freeing contact pressure between the socket and nut prior to upward travel of the socket. Depression of a micro-switch on the right provides momentary contact, shifting the four-way double solenoid valve. The double-acting F-1.75-S cylinder moves the

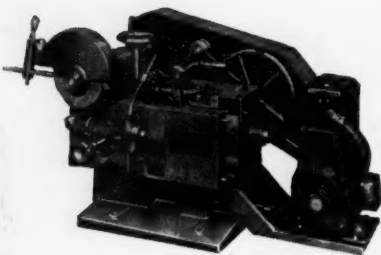
dovetail slide upward to its original position. Upward travel of the slide removes the cam finger attached to the slide from the micro-switch, thereby de-energizing the timer motor and allowing for reset for the next operation. The 4-B bench valve is then shifted, releasing the LS-1 collet fixture. A 183 air press stand is employed for the basic machine member. The complete time cycle is three seconds.

### Brazing Machine Used in Manufacture of Faucet Stems

THE continuous brazing machine illustrated herewith was designed and built by the Waltz Furnace Company of Cincinnati, Ohio, and is used in the manufacture of faucet stems which are made in two pieces. The cup that receives the rubber washer is made of stainless steel on a punch

---

## SHARPENS SAWS IN GANGS FOR LESS THAN 5¢ A PIECE



• If you have been accustomed to paying 20¢ or more to sharpen small millers or screw slotting saws, then the 35 T is a machine that deserves your close attention. Reclaims and restores broken teeth and is accurate to  $\pm .001$ ". It's low in cost, is automatic in operation and has a capacity for small saws from 2 to  $5\frac{1}{2}$ " diameter.

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Cleveland 9, Ohio



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**KENDEX**® is the  
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of Kendex Tools  
which are made  
exclusively by  
Kennametal Inc.



Kendex tools feature a precision-ground, multiple-edge, screw-mounted, indexable Kennametal insert that needs no regrinding. When the insert's multiple cutting edges become dull, to throw it away is economical practice. Replacement cost is slight compared to that of regrinds.

Kendex tooling minimizes downtime for tool changing, eliminates tool grinding expense, and ends the false economy of reconditioning tools that have outlived their usefulness. Ask your nearest Kennametal representative for details. Kennametal Inc., Latrobe, Pa.

## How KENDEX® Works



**1**



Hard, strong, wear-resistant Kennametal is molded into square, round, or triangular Kendex inserts, which are precision ground.

**2**

Kendex inserts are mounted to suitable tool holders with socket head screws.



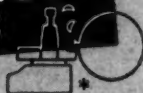
**3**

When edge becomes dull, insert is turned to new cutting position. When all cutting edges have been used, insert is thrown away; no regrinding.



# KENNAMETAL®

CEMENTED CARBIDE TOOLING  
THAT INCREASES PRODUCTIVITY



\*Registered Trade-Marks

A-2

SALES OFFICES IN PRINCIPAL CITIES

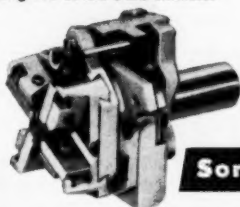


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J & L Automatic Opening Die Heads are sold with this guarantee: that your threads will be held consistently within the exacting Class III tolerances for form, lead and pitch diameter, throughout the long life of the J & L chasers.



FOR BROWN & SHARPE  
AUTOMATICS and SMALL  
TURRET LATHES

Capacities from  
#0 to 1 1/4"



RADIAL CHASER  
TYPE

Capacities from  
#8 to 4 1/4"

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TYPES

Stationary and Re-  
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from #4 to 2"

#### Some of the reasons why:

**COMPACT, RUGGED DESIGN GIVES MAXIMUM SUPPORT TO THE CHASERS.** J & L Dies are made of solid steel, no built-up sections, hardened and precision ground throughout. Chasers are supported at the point of, and in the direction of, maximum strain.

**THREAD FORM, HELIX, PRECISION POINT HEIGHT, ARE ALL GROUND INTO CHASERS AFTER HARDENING.**

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**DIE HEAD DIVISION**

## Tiny Wire Drawing Die Easily Form Ground with Diaform

**T**HE Pratt & Whitney Diaform wheel forming attachment was recently put to a unique test when one owner used it in the grinding of a tiny split wire drawing die having tolerances of  $\pm 0.0002$  inch. The small size of the die, together with extremely close tolerances, necessitated the mak-

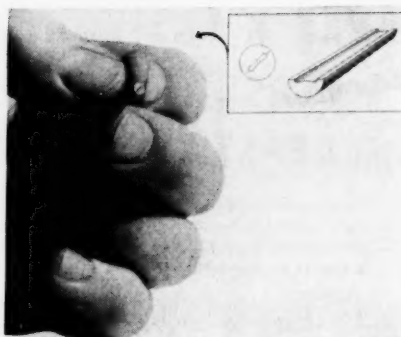
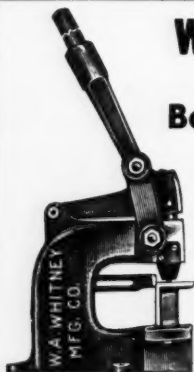


Illustration showing the tiny size split die being held together; also a greatly enlarged drawing of the tiny wire drawing die.

## WHITNEY No. 91 Bench Punch



A very efficient and satisfactory tool for general use, shop or experimental room.

Depth of throat — 5 inches.

Capacity —  $\frac{1}{2}$  thru  $\frac{1}{4}$  or 2 thru  $\frac{1}{8}$ ”.

Notches angles  $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ .

Punches supplied in rounds, squares, ovals, rectangles or specials. Especially adaptable for experimental work. Also made in 10”, 18” and 24” depth of throat.

Write for catalogue.

**W. A. Whitney Mfg. Co.**

640 Race St.

Rockford, Ill.

ing of a preliminary template on a hundred-to-one ratio instead of the usual ten-to-one. This 100-to-1 template, made of 3/32-inch flat stock, was then used with the Diaform and a 100-GV wheel to produce the ten-to-one regular template. Two pieces of correct diameter wire were then placed in a V-block and ground with a Diaformed wheel to the required form and thickness.

## Portable Saw Reduces Cutting Time on Steel Panels

**T**HE Building Panel Division of Detroit Steel Products Company produces 16-gauge cellular steel panels which, after having been built to specifications, are welded to the structural “I” beams of a building. The

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17 DIFFERENT SIZES**

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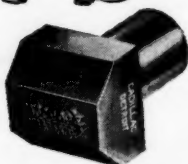
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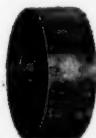
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Assuring the utmost in accuracy—used in marking machines, lathes and screw machines.



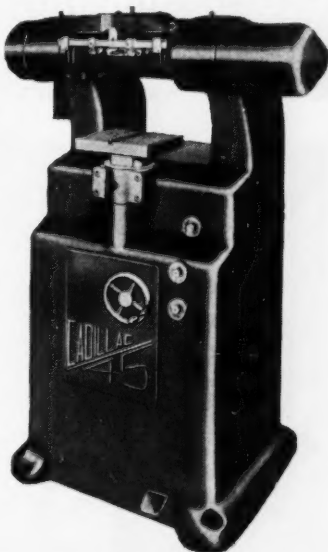
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Write for Bulletin SE-130

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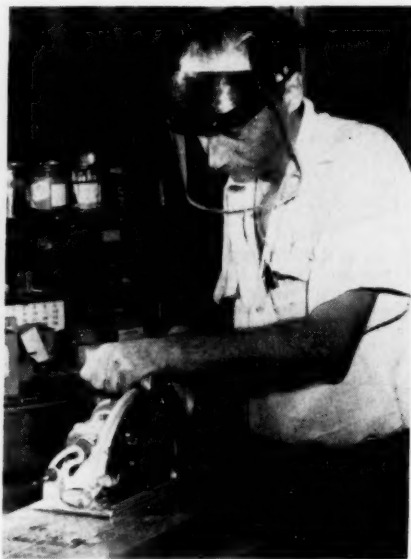
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panels form a structural floor and electrical raceway system upon which a concrete wearing surface is poured. Cutting and notching of the ends of the panels varies according to job conditions. Operators at Detroit Steel found stationary saws impractical for performing these operations since their use required manifold handlings of the panels, and, in addition, it was



Operator at the Building Panel Division of Detroit Steel Products Company is shown using a Skil Model 825 Saw in cutting a 16-gauge steel floor panel.

an awkward job trying to feed the panels into the stationary machines.

The problem was finally solved with a Skil Model 1825 Saw equipped with a carbide-tipped blade. The operators discovered that it was easier to guide the saw through the material being cut than it was to guide the material into the saw, as was required with a stationary tool. Also, the portable Skil Saw was found to cut much faster, and it was adaptable to angle cutting.



# Milling Machine Attachments that

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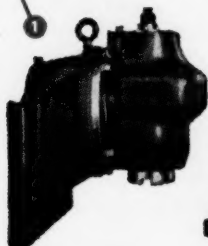
**Slotted Keyseating**  
Keyseating, broaching, general slotting, tool and die making, etc. (Bulletin No. 107)



**Hi-Speed Universal**  
High speed angular milling in all planes. (Bulletin No. 113)



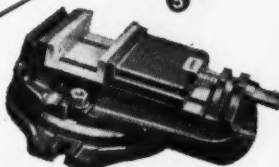
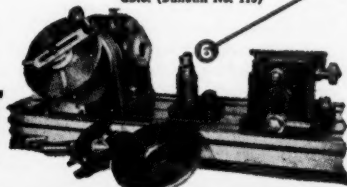
**Arbors and Accessories**  
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**Dividing Head**  
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THE KEMPSMITH MACHINE CO., MILWAUKEE 14, WISCONSIN, U. S. A.

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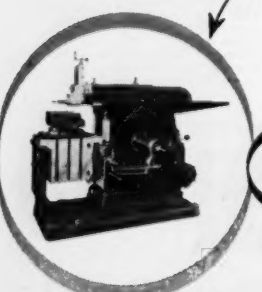
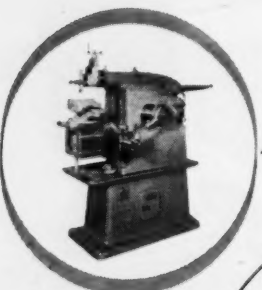
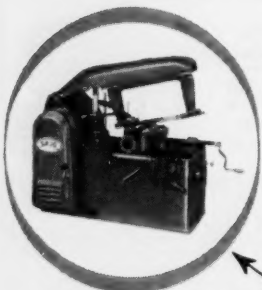
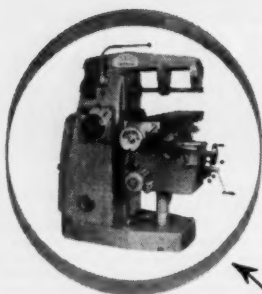
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**VMA SHAPERS** are available in both standard and heavy duty models— 14" to 26" length of stroke. These rugged amply powered machines provide speedy set-up, ease of operation and maximum stamina in the toolroom or production line. Automatic lubrication and table power rapid traverse are standard on heavy duty models. Universal table and other accessories are available.

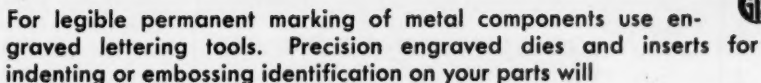
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# ideas from readers

## Automatic Chip Blowout with Four-Way Valve

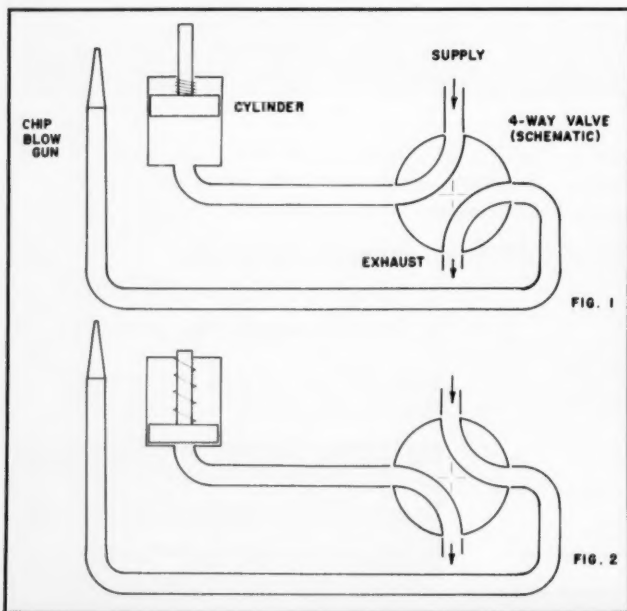
By H. G. FROMMER

**M**ANY air-operated clamping devices utilize single-acting air cylinders with spring return. Moreover, almost all fixtures, when used in cutting operations, require chip blowout

after and/or before the work has been removed. It is often practical and economical to fasten the air nozzle to the fixture in such a manner that the nozzle or hose does not have to be handled by the operator. If then a four-way valve is used to operate the air cylinder instead of the usual three-way valve, the operator can direct air through the chip removal hose without

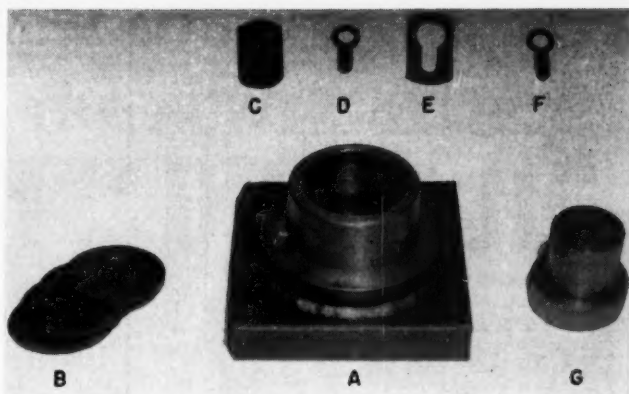
removing his hand from the air valve.

Figure 1 shows a schematic drawing of an air circuit with valve in clamping position. After throwing the valve into the release position, a circuit as shown in Figure 2 causes the air supply to go directly to the blow-out hose. Many



This sketch shows how a four-way air valve can be used to provide for automatic chip blowout before or after work has been removed from its clamping fixture.

Fig. 1 — Illustration showing punch and die equipment used in producing terminal strips: A, die holder; B, die of neoprene discs; C, blank; D, punch; E, scrap; F, finished piece; G, ram extension



four-way valves also have a neutral position, in which air is exhausted from the cylinder while the air supply is shut off completely. This type of valve is to be preferred since it permits the operator to remove the workpiece (if desired) before blowing the chips away.

## Neoprene Dies for Hand Punching

By HOWARD CAMPBELL

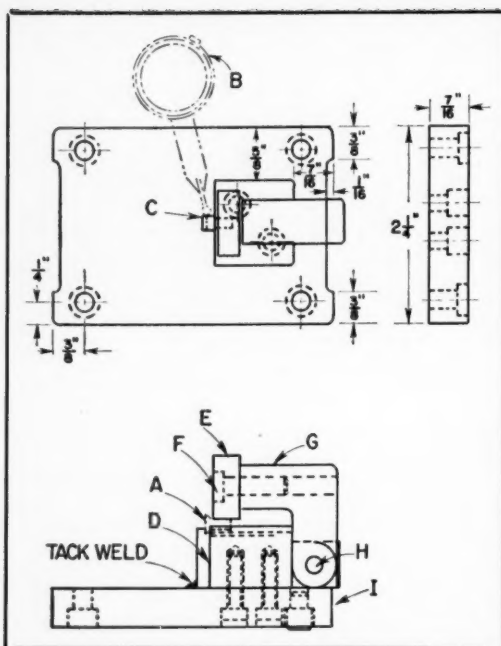
**T**HE illustrations herewith show the equipment used at the Air Force Missile Test Center shops at Patrick

Air Base, Florida, to punch terminal strips from 0.030-inch thick copper-bronze sheet. A preliminary operation of cutting by hand, from the sheet, discs small enough to fit into the die holder is required, following which a single punching operation is performed to produce a finished piece. The punch is shown at D in the illustration Fig. 1; the blank, scrap piece, and finished piece are shown at C, E, and F respectively.

At A in Fig. 1 is shown the die holder, which is turned and bored from cold rolled steel and welded to a steel base 6 inches square x 1 1/4 inches thick. The die holder is bored 2 3/4 inches in diameter x 2 inches deep, and the ram extension G, also of cold rolled steel, is made to fit. The punch is of 3/32-inch ground flat stock.



Fig. 2 — Illustration showing job set up for processing on a hydraulic hand press



Drawing of unique concentricity gage used for checking relationship between the body and outside diameter of a rivet.

utilizes a Federal indicator, **B**, the indicating point of which contacts the outside diameter of the rivet head, as shown at **C**.

An unusual advantage of the gage is the fact that as the rivet rests in the hardened V-block **D**, it can be easily rotated by revolving the rubber-lined wheel **E**. This wheel or roller is mounted on a stud, **F**, which is pressed into a swivel arm, **G**, that pivots about a dowel pin, **H**. In this manner, the small rivet can be easily held against the hardened V-block and simultaneously slowly rotated for checking purposes.

The entire assembly is mounted on a base plate, **I**, which is fastened to an accurate indicator base. The indicator **B** is mounted on the same base and effects a quick and accurate concentricity check of the rivet. This gage can also be applied to other concentricity checking operations where speed and accuracy are important.

The parts **B** are the four neoprene discs which serve as the die, to provide the necessary "spring" to perform the operation. The discs are positioned in the hole in the die holder, the blank piece of sheet metal **C** is positioned over the discs, the punch **D** is placed in position on the sheet, and the ram of the machine to which is attached the extension **G** is pulled down, forcing the punch through the sheet and producing the finished piece **F** and the scrap piece **E**.

## Unique Concentricity Gage

By C. BOSSMANN

**T**HE unique concentricity gage shown in the accompanying drawing is used to check the relationship between the body and the outside diameter of a small rivet, **A**. The device

## Unusual Abrasive Finishing Tool

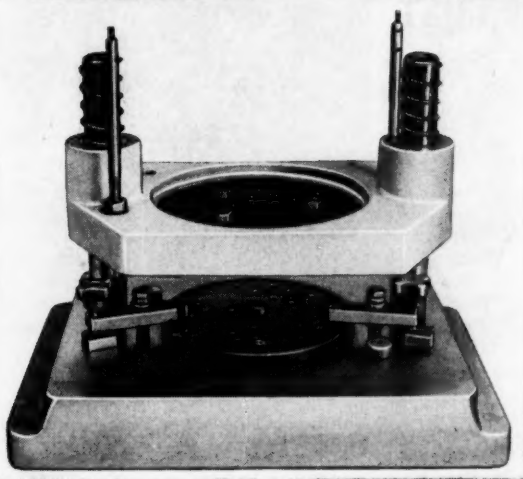
By B. G. LAWRENCE

**C**ONVAIR'S San Diego division is saving more than \$4,500 annually by using the unique tool shown herewith for finishing aircraft parts. A small circular piece of emery paper is held against the part by a metal shaft fitted with a cylindrical piece of rub-



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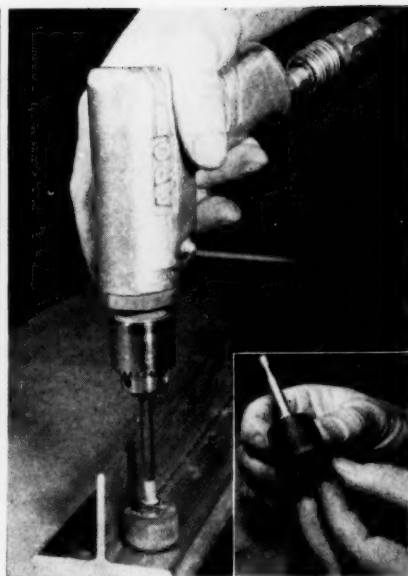
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This illustration shows how a unique finishing tool comprising a cylindrical piece of rubber fitted on a metal shaft is used in connection with a circular piece of emery paper to minimize finishing time on aircraft part at Convair.

ber. Finishing work was formerly done by hand-polishing small parts with emery paper wrapped around a block of wood. The new method saves 3,000 hours annually, produces higher quality finishes, and enables operators to reach difficult spots.

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.



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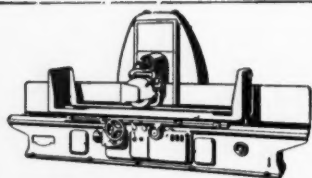
# MATTISON GRINDERS

*If it's a Flat Surface to Grind  
There's a Mattison to Grind it.*

● With the addition of the production grinding machinery formerly made by the Hanchett Manufacturing Company, Mattison now is in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced fixture engineers are available to give you best production efficiency with Mattison Machines.

For any flat grinding, ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalog on all machines, ask for free copy of general bulletin.



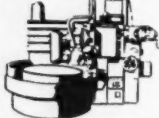
Precision Surface Grinders  
Horizontal Spindle



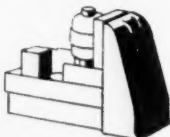
Disc Grinders,  
Double Spindle Type



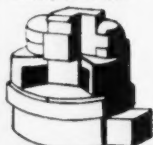
Vertical Spindle  
Disc Grinders



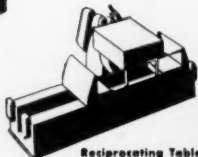
Plane Grinders,  
Rotary Table Type



Rotary Table  
Surface Grinders



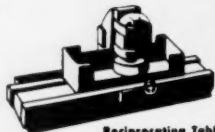
Automatic Rotary  
Surface Grinders



Reciprocating Table  
Face Grinders



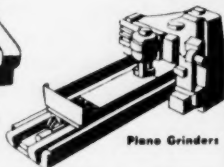
Disc Grinders,  
Single Spindle Type



Reciprocating Table  
Surface Grinders  
Vertical Spindle



Face Grinders,  
Traveling Wheel



Plane Grinders

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## MACHINE WORKS



40 hours before — now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder



120 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder



900 connecting rods per hour, using 40 station fixture to finish grind crank and wrist pin end of assembled rod with Mattison No. 72 Grinder



Shows variety of work run on Mattison Face Grinders

Six Sub-Zero industrial freezers are currently in use at A. V. Roe. High speed steel cutting tools are chilled to  $-120^{\circ}\text{F}$  as part of the heat treating process to produce greater hardness and strength and improved ductility. All types of gauges—snap, plug and profile—are Sub-Zeroed for stability to eliminate growth and distortion.

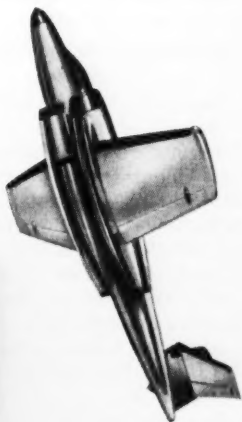
The Sub-Zero units are also used extensively for shrink fit of components, and for test cell calibration.

"Definitely an essential piece of equipment", reports A. V. Roe on their Sub-Zero freezers.

*Write for new catalog giving complete technical data on Sub-Zero metal treatment. Standard and special freezers in any size or capacity.*

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## **sub-ZERO freezers essential in heat treating**



reports

**A.V. ROE, Canada**

**jet engine maker**



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## news of the industry

### Carborundum's Abrasive Workshop

"Carborundum's Abrasive Workshop," a unique mobile unit equipped to demonstrated coated-abrasive grinding under actual production conditions, has been announced by The Carborundum Co., Niagara Falls, N. Y. Believed to be the first of its kind in industry, the traveling workshop will carry the story of the company's coated-abrasive products to customers and prospects throughout the entire country. An innovation in "mobile selling," the 35-foot long x 12½-foot high vehicle contains the means for

showing the abrasive products in use and how various applications can benefit users. Contained in the 19-ton workshop is a total of eight stationary coated-abrasive grinding machines and a variety of portable tools—some standard and some completely new—which are demonstrated in actual production grinding operations. The selection of tools is said to be so complete that it virtually covers the range of representative applications and potential uses for coated abrasives in the metals industry.

Perhaps the most novel feature of the vehicle is the expanding sidewall which increases the effective width of the workshop to a total of 15 feet when the unit is stationary, thus



Carborundum's 19-ton, 35-foot long x 12½-foot high abrasive workshop. The vehicle is equipped to show the company's coated-abrasive products in action and how applications of them can benefit users.



An innovation in "mobile selling," Carborundum's Abrasive Workshop contains the means for demonstrating coated-abrasive products in actual production use. Warren K. Seward, sales engineer assigned to the workshop, is shown finishing a ceiling light fixture stamping for plating on board the mobile unit. He is performing the polishing and blending-in operation with a new versatile belt-grinding and polishing machine which is designed to provide contact wheel, platen or slack-of-belt principles.



providing a seating capacity for an audience of from about 12 to 15 people when demonstrations are underway. The vehicle is completely self-contained and supplies its own power to operate the machine tools, interior fluorescent lighting, and heat or air conditioning. Two five-ton air conditioners provide for audience comfort and operate a dust-disposal unit used in conjunction with the grinding machines. A small compressor is available to power the portable tools. In addition to the abrasive machines, the vehicle has a complete sound system, incorpo-

rating a message repeater, a sound motion-picture system, and a library of literature describing the abrasive tools and their applications.

More than 20 grinding demonstrations have been devised, representing a wide variety of typical grinding operations. Only a selected grouping will be presented at any one time, however, in keeping with the interests of the audience. The mobile workshop recently began its demonstration tour

Contained in the traveling workshop are eight stationary coated-abrasive machines and a variety of portable grinding tools. This permits demonstrating the coated-abrasive products in actual production grinding operations.



in Buffalo, New York, and, from that point, has proceeded along a route which will cover many thousands of miles.

### Pressed Metal Institute Fifth Annual Spring Technical Meeting

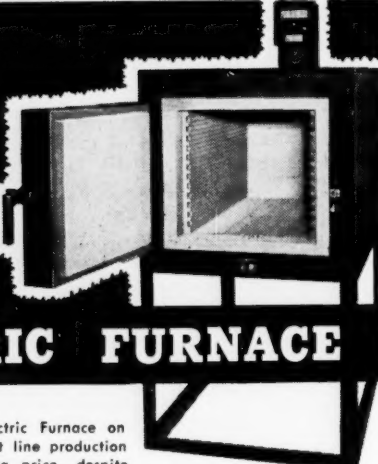
The 1954 Annual Spring Technical Meeting of the Pressed Metal Institute

will be held at the Hotel Carter in Cleveland, Ohio, March 17 through the 19th. Subjects to be discussed during the technical sessions on March 18 and 19 include "Resistance Welding," and "in process material handling."

Those in attendance will also have an opportunity to visit three prominent plants in the Cleveland area. "Safety in a Stamping Plant"

will be the theme of the first day's meeting. The 1953 Technical Meeting inaugurated the safety program and its success has encouraged P.M.I.'s Technical Research and Standards Committee to annually expand the meeting to a three-day session with the first day dedicated to accident reduction in the metal stamping industry.

James L. Chase, E. W. Bliss Co., Detroit, Mich., is general program chairman for the meeting. Mr. Chase's committee includes Frank Humberger, Technical Metal Processing, Inc., Cleveland, Ohio; Frank Schmidt, Jackson Metal Products Co., Jackson, Mich.; and Phillip C. Wood, The Acklin Stamping Co., Toledo, Ohio.



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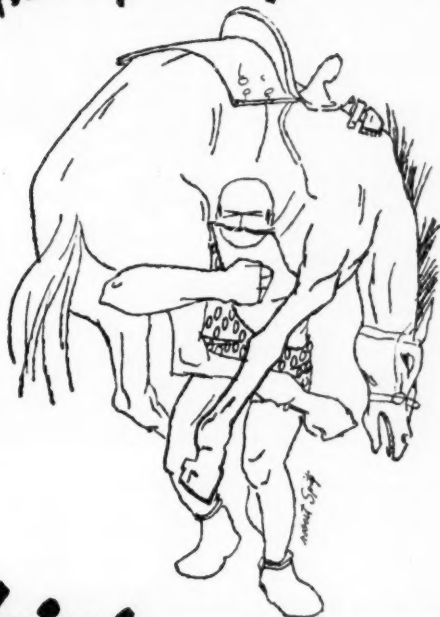
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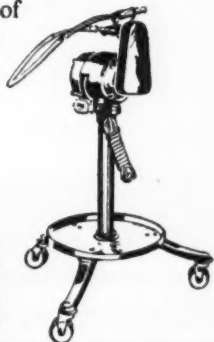
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Within a period of 23¼ minutes after the demonstration started, all eight machines mounted on leveling Barrymounts were in operation. All of these machines were producing as though they had been in these areas since the work day began. On the left, the machine, using the conventional method, was still in the process of being mounted.

### Demonstration of Plant Mobility Held at Barry Corporation

Top officials of the Office of Defense Mobilization and other Government agencies recently witnessed at the Barry Corp., 1032 Pleasant St., Watertown, Mass., a demonstration which may offer a possible solution to the problems of plant dispersal in time of national emergency. Through the use of the new leveling Barrymount, a

complete assembly line was dismantled and replaced by a production line of nine heavy machines which were in operation within 45 minutes. On hand to see the demonstration from the Office of Defense Mobilization were Brig. Gen. Henry Parkman (Ret.), Assistant Director for Non-Military Defense, and Col. Theodore Enter, Chief of the Continuity of Industry Section.

Using its own plant space as the set-

## LUERS

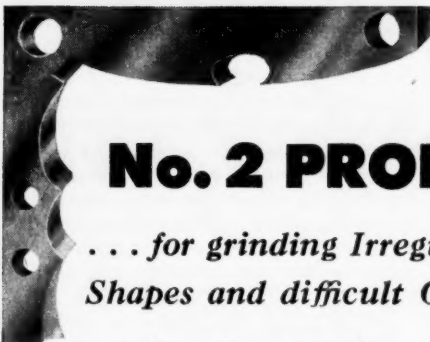
### PATENTED CUTTING OFF TOOL HOLDERS PATENTED CUTTING OFF BLADES

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured by

J. MILTON LUERS, 12 Pine Street, Mt. Clemens, Mich.

Produced under License Issued by John Milton Luers Patents Inc.



# Boyar-Schultz

## No. 2 PROFILE GRINDER

*... for grinding Irregular  
Shapes and difficult Contours*

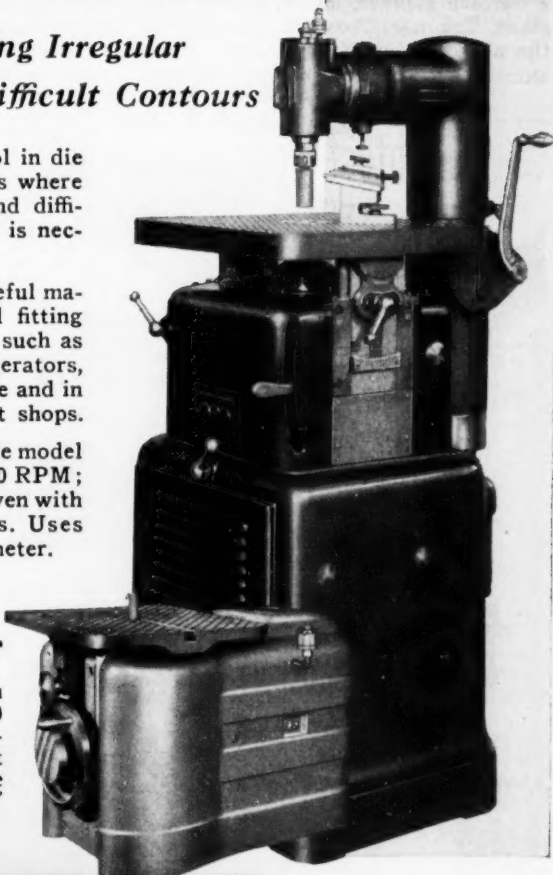
A standard machine tool in die shops and in tool rooms where grinding odd shapes and difficult, irregular contours is necessary.

It is a particularly useful machine for grinding and fitting large dies and punches such as forming dies for refrigerators, table tops, sanitary ware and in automotive and aircraft shops.

Spindles in dual spindle model illustrated, turn at 10,000 RPM; stock removal is rapid even with small diameter wheels. Uses wheels  $\frac{1}{4}$ " to 3" in diameter.

### No. 1 Profile Grinder

A bench model with spindle speed of 20,000 RPM. Performs in minutes, many jobs that would ordinarily require hours. Uses wheels  $\frac{1}{8}$ " to 1" diameter.



**BOYAR-SCHULTZ**  
C o r p o r a t i o n

DEPT. AK, 2120 WALNUT STREET, CHICAGO 12, ILL.

WRITE  
FOR LITERATURE  
FULLY DE-  
SCRIBING THESE  
TIME SAVING  
MACHINE TOOLS

ting, the Barry Corporation ran a timed test showing exactly how long it takes to replace an assembly line in operation with a production line. Beginning at 2 o'clock, a complete assembly line was removed and replaced by a group of nine heavy machines, including punch presses, a wheel press, a surface grinder, and a milling machine. The machinery was mounted on the new leveling Barrymounts which eliminate the need for bolting, cement-

ing, or lagging the machinery to the floor.

At the same time, a comparative test was run with the punch press being installed by the conventional method. A time clock was prominently displayed in order to show graphically the entire time the demonstration took. In effecting the switchover, Barry also employed other recently-developed devices which have helped considerably to increase plant mobility and reduce installation time.

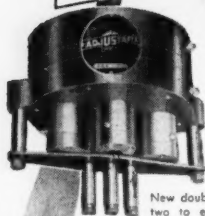
These included flexible power distribution lines, air screw drivers, and electrical nut runners.

"The demonstration conclusively proved," stated Ervin Pietz, president of Barry, "that at least nine machines mounted on leveling Barrymounts can be installed in less time than it takes to install one machine by the conventional method. This achievement is an important step toward increased industrial efficiency." The occasion for the demonstration was the tenth anniversary of the corporation which is also engaged in the manufacture of vibration and shock isolators for radio and electronic equipment.

...to protect your investment...  
save time, money and labor!

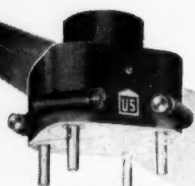


U. S. drill heads are built for continuous use, with full anti-friction bearing construction, for high capacity thrust leads . . . precision-bored, outboard spindle support plate.



New double eccentric Adjustafix, two to eight spindles, for any adjustment. Eliminates the expensive change in set-up from job to job by simply changing the drill pattern plate and relocating spindles. Fully automatic lubrication for either horizontal or vertical operation.

The universal joint adjustable multiple spindle type, an adaptation of a universal joint adjustable spindle, is suitable for any sensitive drilling machine. Joints self-lubricating. Designed for quick change.



Single eccentric type for equally spaced holes on bolt circles.



We manufacture all types of multiple spindle, fixed center, adjustable and lead screw topping heads.

**UNITED STATES DRILL HEAD CO.,**  
616-618 Burns St., Cincinnati 4, Ohio



# PROVED IN 8 YEARS' SERVICE



*Lusol..*

all-chemical metal working  
solution

Lusol is no newcomer to metalworkers. Your industry has been using it successfully for 8 years. What's more, they're crediting it with production increases ranging from 50% to 500%.

## **faster machining . . . no smoke . . . no skin irritation**

Lusol successfully conditions water, making it suitable as a coolant. Tools and work run cooler even at higher machine speeds. Faster machining is smokeless with Lusol because it's composed entirely of harmless chemicals.

It's safe for workers' skin! Lusol in pH

tests (tests of mildness) proved milder than toilet soap. Workers even wash their hands in it!

Prove-in Lusol on one of your machines. Give it a tough test. For eight years Lusol has been successful on even the most difficult prove-in trials.

Write for "Lusol Gets to the Point", a booklet describing Lusol, what it does and how it works in all types of machines in hundreds of machine shops.



**F. E. ANDERSON OIL COMPANY, INC.**  
**Box 216J • Portland, Conn.**



Illustration showing presentation of 20-year service pin being made to Franklin Farrel III, by Joseph LeMay, Farrel - Birmingham secretary, third from left, as two "Old Timers," each with 59 years of company service, look on—Edward Kennedy, left, and Edward Stuart, right.

### Franklin Farrel III Receives 20-Year Service Pin

At a recent Farrel-Birmingham annual service pin award ceremony, Franklin Farrel III was among those to receive a 20-year pin. Mr. Farrel,

the son of Franklin Farrel, Jr., retired chairman of the board. He is the fourth generation descendant of Almon Farrel who, with his son Franklin Sr., founded the company in Ansonia, Connecticut, in 1848.

executive vice president of Farrel - Birmingham Company, Inc., is

## solve heat-treat problems

with versatile  
Temco bench-  
type furnace

STRONG STEEL BODY WITH  
ROUNDED CORNERS  
REINFORCED WELDED  
CONSTRUCTION

DOUBLE ACTION DOORS EASY  
TO OPEN BOTTOM SECTION ONLY  
OR BOTH SECTIONS AT WILL

6" FIREBRICK AND BACK-UP  
INSULATION

4 HEAVY GAUGE EMBEDDED  
TYPE ELEMENTS HEAT  
FAST AND EVENLY

1700 SERIES

CONTROLS AVAILABLE  
SEPARATELY OR WITH  
WIRED PANEL SHOWN

Step up production, cut costs with Temco electric furnaces for heat treating dies, parts, tools, etc. Model illustrated above one of eight convenient sizes available with either electronic or manual temperature controls. Economical, easy

to install and operate, low cost. Priced from \$55.00 to \$507.50. Write for literature and nearest dealer's name.



## ELECTRIC FURNACES

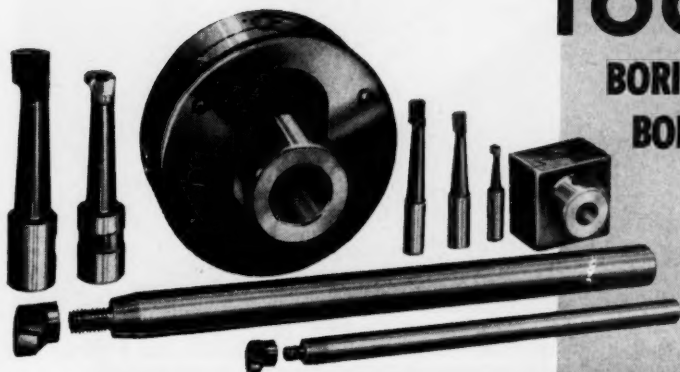
THERMO ELECTRIC MANUFACTURING CO.

488 HUFF ST., DUBUQUE, IOWA

for more *Accurate* cuts...  
greater *Rigidity* in

## BORING TOOLS

BORING HEADS  
BORING BARS



## Use **CRITERION** BORING EQUIPMENT

### BORING PROBLEMS? CLOSE TOLERANCE?

Try Criterion Boring Tools. Built with the same care and quality as the time-tested Criterion Boring Head.

### THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from 1½ to 7 inch diameter. Boring tools, carbide or high speed steel, ⅜ to 1¼ inches diameter. Bore holes from ⅛ to 20 inch diameter.

Accuracy for the closest tolerance • Rigidity for the heavy cuts • Heat-treated parts for long wear

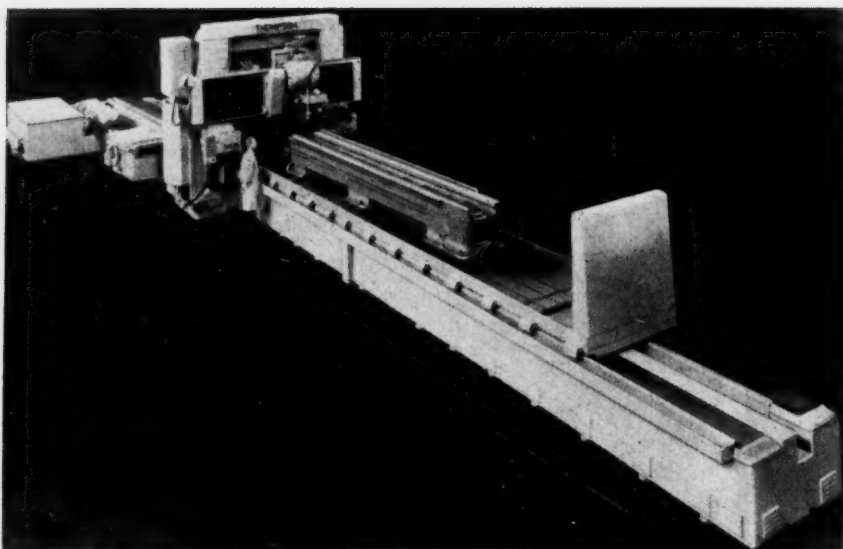
### LARGE OFFSET SAVES TIME AND TOOL CHANGES

These tools will cut your boring costs.

See the complete line of **CRITERION TOOL PRODUCTS** at your local dealers or write for free catalog.

**CRITERION  
MACHINE WORKS**

**9312 SANTA MONICA BLVD • BEVERLY HILLS, CALIF.**



Huge Thompson Surface Grinder installed in plant of Monarch Machine Tool Company

### Monarch Installs Huge Surface Grinder

The Thompson Grinder Company recently completed installation of what is believed to be the world's largest surface grinder in the plant of the Monarch Machine Tool Company. This machine was especially designed to precision grind lathe bed ways up to 32 feet long and to the extreme tolerance of five ten-thousandths of an inch over the entire length of way.

The machine measures 79 feet long x 13 feet high x 13½ feet wide and is equipped with four 30-h.p. motors and one 40-h.p. motor driving the two grinding wheels. The grinding wheels can be operated simultaneously, and all operations are controlled from a push-button panel which is suspended and can be moved to suit the convenience of the operator. The huge machine weighs a total of 220,000 pounds.

ON OILY AND GREASY FLOORS

**STOP**

COSTLY SLIPPING ACCIDENTS

DEPT. RM-3

USE **Tamms**

**FULLER'S EARTH**

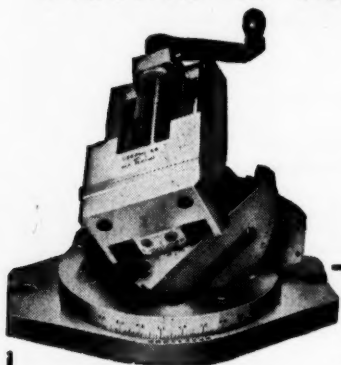
Adds greatly to the safety of your shop • Provides safe non-slip footing • Absorbs oil and grease • Lessens fire hazard because, unlike saw dust or wood shavings, it is non-inflammable • Every shop needs this low cost safety aid.

*A trial will convince you. Send for FREE SAMPLE.*

**TAMMS INDUSTRIES, INC. 228 N. LA SALLE ST., CHICAGO 1, ILL.**



# PICTURE OF ANGLE JOB SETUP WITHOUT **WESSON** UNIVERSAL VISE



Speedy, precision angle set-ups are simple, fast and economical when you use Wesson's 3-way Universal. Wesson angle vises eliminate many costly special fixtures.

**WESSON PRODUCTS CO.**  
1220 Woodward Hts. Blvd.  
Ferndale (Detroit 20), Mich.

Please send me illustrated  
bulletin of WESSON Univer-  
sal VISES and ANGLE PLATES.

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Firm Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
City

\_\_\_\_\_  
State

### Scully-Jones Training Clinic

Scully-Jones & Co., Chicago, Ill., recently held a three-day sales training school at its plant for agents and distributor salesmen. J. Dudley Lockrem, vice president and director of sales, and John R. Brown, marketing manager, were in charge of the program. Speakers were H. Dale Long, president of the company; Mr. Lockrem; Harry Conn, chief engineer; Bernard Better, director of research; J. Kosin-

ski, works manager; James Sklenar, regional sales manager; and Mr. Brown; plus members of the Scully-Jones research, engineering, production, and sales departments. Comprehensive shop and classroom instruction covered the complete line of Scully-Jones "Precision Holding" tools. Special emphasis was placed on the company's new lines of "Roll-Lock" tools, "Safe-Torque" tap drivers, floating tap and reamer holders, and automatic recessing tools.

In attendance at the training session were M. D. Bobier and Robert E. Wiley, Bobier Tool Supply Co., Flint, Mich.; A. D. Grover and M. F. Shields, Grand Rapids Supply Co., Grand Rapids, Mich.; C. W. Riley, C. E. Hamlin Co., Jackson, Mich.; Mason B. Ingalls, Sr., Mason B. Ingalls, Jr., and Jack Whiting, Oliver-Ingalls Associates, Cleveland, Ohio; F. M. Correll and H. M. Drissen, Rickert Industrial Supply Co., Inc., Milwaukee, Wis.; Bill Aytes and Bernt Nordfjord, Scully - Jones & Co., Detroit, Mich.; Ray Stull, Oliver-Ingalls Associates, Toledo, Ohio; Bowen Conn, Ft. Wayne, Ind.; Frank B.



### for greater Production Economy

From start to finish, NEWCOMER CARBIDES are made in our own plant... to high controlled-quality standards.

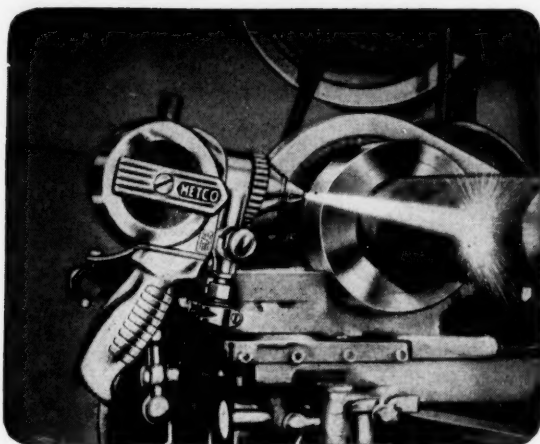
NEWCOMER CARBIDES are made to give you greater production economy through heavier feeds, faster cutting speeds and greater wear resistance than most other carbides. Complete stocks of standard carbide blanks, cutting tools and mechanically held tools are available for ready delivery.

For your particular cutting problem, consult a Newcomer Tool Engineer... there's one located near you.



**NEWCOMER PRODUCTS, INC.**  
LATROBE, PENNSYLVANIA  
General Sales Office: 512 Franklin Ave., Pittsburgh 21, Pa.





**now  
a really  
low-cost  
metallizing  
installation...  
with the new  
Metco L-Gun**



**Metallizing damaged journals on turbine shaft**



**Building up worn brake-drum**



**Metallizing protective coating on steel plate**

**New, low, compressed-air requirements... only 10 cfm at 40 to 60 psi, already available in many shops, or supplied by inexpensive 3 hp compressor... bring metallizing within reach of the small user.**

Here's a chance for the smaller maintenance shop to get into profitable metallizing operations like these:

- ▶ Save up to 90% of replacement costs on machine repair jobs,
- ▶ Do your own hard-facing,
- ▶ Apply long-wearing corrosion-resistant coatings to exterior plant structures, tanks and other equipment.

**Sprays 23 Different Metallizing Wires—**With the new L-Gun you can spray .10, .25, .80 carbon steels, stainless; babbitts, brass, bronze; nickel, aluminum, tin, zinc; special hard-facing materials such as Metco-Weld H, and the new self-bonding Sprabond wire.

**It's Versatile—**Use the L-Gun machine-mounted or hand-held—it weighs only 4 lb. 2 oz. Do all kinds of metallizing work—shaft and bore build-up with harder, longer wearing metals; build up worn pump plungers, crankshafts, motor shafts; apply corrosion-resistant coatings. There are hundreds of different jobs that are "naturals" for metallizing.\*

**Same High Quality as Other Metco Guns—**The low air requirements of the new L-Gun have been achieved without any

sacrifice in Metco quality. It embodies new developments in turbine and nozzle construction—is built, like all Metco guns, for rugged, dependable service.

**A Real Opportunity for the Smaller Shop—**Thousands of large, well-known companies have been metallizing users for many years, not only in maintenance but in production applications on original equipment. Now, with the development of the new L-Gun, and a low cost installation, metallizing is within the reach of even the smallest plant. (We'll be glad to send you the names of some Metco users—large and small.)

**Free Bulletin or Shop Demonstration—**Send off the coupon for the detailed information Bulletin 55 gives you. Or, better still, ask for a demonstration in your own shop by a Metco Field Engineer. He'll be glad to show you how the new Metco L-Gun works on some job of your own. No obligation, of course.



See other examples of metallizing illustrated in our 8-page Bulletin in your Sweet's Plant Engineering File—Section 7a/Mc. The following names are the property of Metallizing Engineering Co., Inc.  
METCO® • Sprabond wire • Metco-Weld

REG U.S. PAT. OFF.

**METALLIZING ENGINEERING CO., INC.**  
38-14 30th STREET LONG ISLAND CITY 1, N. Y.

10 Great Britain: METALLIZING EQUIPMENT COMPANY LTD, Chobham near Woking, England

Don B. Watson  
**METALLIZING ENGINEERING CO., INC.**  
38-14 30th Street Long Island City, New York

☐ Please send me more information about metallizing.  
☐ Please arrange a demonstration in my shop.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



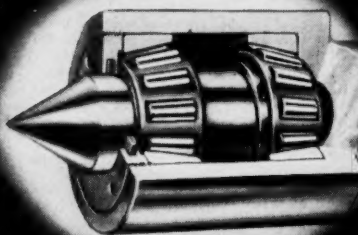
Illustration showing agents and salesmen who attended recent Scully-Jones Training Clinic

Sturm, Jr., Sturm Tool Supply Co., Lansing, Mich.; Phil Eicher and Larry Emark, The E. A. Kinsey Co., Cincin-

nati, Ohio; and Harry Timmer, Lakeshore Machinery & Supply Co., Muskegon, Michigan.

... heavy loads at high speeds

## *Falls* ROTO CENTER



for  
lathe and grinder  
tail stocks

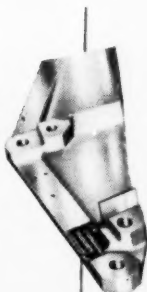
Accurate, low cost turning on tough continuous-run work. Preloaded, matched roller bearings assure rigid set-up. Precision ground shank. Heavy-duty grease seal. Many exclusive features.



**FALLS PRODUCTS, INC., 124 Genoa Street, GENOA, ILL., U.S.A.**

where

*Precision*  
counts

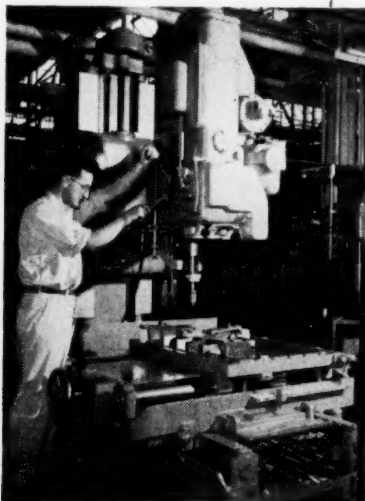


a  
natural  
combination  
hard to beat . . .

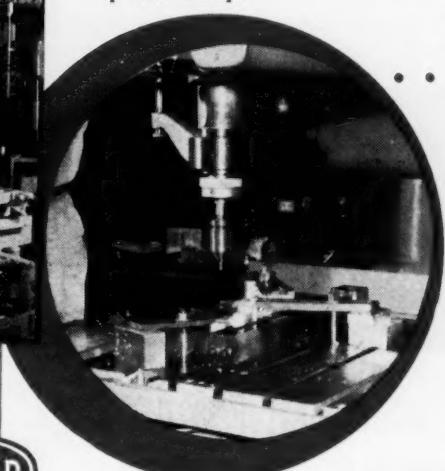
Bullard 30 x 20 Spacing Table installed on Cincinnati-Bickford fixed arm Precision Drilling Machine at Convair (Consolidated Vultee Aircraft Corporation, San Diego, California) is proving that these two units "pay-off" in elimination of jig cost, speeding-up production and accuracy in repetitive drilling on a variety of work.

A new job goes into immediate production with no lost time — no waiting for preparation of jigs.

Simple and comparatively fast change-over from one job to another minimizes production tie-ups.



Precision work materially reduces if not entirely eliminating spoilage and provides complete interchangeability of parts.



**BULLARD**

**SPACER**

*Ask for information on Precision Drilling without Jigs*

We can offer FAVORABLE DELIVERIES on BULLARD SPACERS

**...THE BULLARD COMPANY.....**

**B R I D G E P O R T 2 • C O N N E C T I C U T**



Inspecting the first Gisholt Type S Balancing Machine are (left to right) Werner I. Senger, vice president in charge of balancing; George H. Johnson, president, and Alfred B. Morey, vice president and treasurer.

**Gisholt Restyled Balancer Line**  
The accompanying illustration shows the first machine of an improved and

els, and two new bench models. Rotating parts weighing from 4 oz. to 300 lb. are covered by these machines.

restyled line of "Dynetric" Type S Balancing Machines announced by Gisholt Machine Co., Madison, Wis. The line of Type S machines includes four floor models, two vertical mod-



... now  
even better with  
**79E BOND**

**the new miracle  
grinding wheel bond**

Greatest selection of sizes and shapes for every application. Best of all, deliveries are good . . . ready when you need them.

Try Chicago Mounted Wheels—bonded with 79E Bond—and you'll never buy any other! This tough new grinding wheel bond, exclusive with Chicago Wheel, has taken the industrial world virtually by storm, doing a better grinding job faster.

**CHICAGO WHEEL & Mfg. Co.**

Dept. MMS, 1101 West Monroe St., Chicago 7

*Only* **SUPERIOR**  
**DIE SETS**  
 Give You These

**3** *Features*  
 For Safer  
 Faster Handling






**1. SAFETY FLANGE**      **2. LOCK JAW LIFTING DEVICE**      **3. E-Z LIFT SLING CHAIN**

It's no longer necessary to take needless risks in handling die sets. Risks that might easily injure the hands of skilled die makers, ruin costly dies in process or completed, or even damage press equipment. Safety features of Superior die sets have eliminated all of these dangers and have speeded up the overall handling of sets from the bench to the press. Prove to yourself the merits of these safety features in both small and large die sets. **FREE CATALOG** — Write today for this helpful data on Superior die sets and die makers' supplies.

**FOR FAST LOCAL  
 SERVICE CALL  
 THESE SUPERIOR  
 REPRESENTATIVES**

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 Atlanta, Ga., Atwood 7771  
 St. Paul, Minn., Prior 6485  
 Cleveland, O., Kenmore 1-2015

**SUPERIOR** STEEL PRODUCTS CORP.  
 2754 S. 19th ST., MILWAUKEE, WIS.

## Engineering Awards Made by Lincoln Foundation

Dimitri Soussloff, associate director of research, Universal Winding Co., Providence, R. I., received First Award in the recent national Award Program for welded machine designs sponsored by The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. Mr. Soussloff was presented the First Award of \$2,981 for his description of a yarn twisting machine, parts of

which were redesigned for welded construction. The award was one of 77 made by the Foundation to engineers and designers in all parts of the country in its \$30,000 Mechanical Design Award Program. Awards were made for descriptions of the design and fabrication of welded steel machines and components.

The Second Award of \$2,682 was given to David W. Kinney, chief engineer, Pattin Mfg. Co., Marietta,

Ohio, for his description of a special machine which was made to mechanize an unsafe and expensive hand grinding operation on wedges used in bolting mine roofs. Robert J. Neville, vice president in charge of manufacturing, North American Mfg. Co., Cleveland, Ohio, received the Third Award of \$2,385 for describing the re-design for welded construction of industrial-type gas and oil burners. Awards were for designs covering a wide variety of machinery, including metal-cutting, electrical, conveying and pumping, compressing, tooling, processing equipment, wood-working, and others.


# THE Di-Profiler

## RECIPROCATING HAND MACHINE

Pat. Pend.




**Saves You Hours  
On Intricate Jobs**




Internal holes  
and  
irregular dies



Convex or  
concave surfaces



Tool edges



Internal or  
external tapers



Shoulders  
and recesses

The Di-Profiler is indispensable for die, tool and mold work. . . . Far superior to manual operation, it is used for finishing straight or curved surfaces, small holes, dies, molds, regular or irregular drawing dies, re-working hardened material and for many other similar jobs.

**Light — Fast — Precise  
Variable Speed and Stroke**

The Di-Profiler has a controlled stroke variable from 0 to 6 mm ( $\frac{1}{4}$  inch), and a speed of reciprocation that can be varied from 0 to 100 strokes per second. It is simple in construction, free from vibration, weighs less than one pound, and is accurately and easily controlled during operation.

**For Complete Information Write For  
New Technique Folder 5-154.**

**ENGIS EQUIPMENT COMPANY**

431 South Dearborn Street, Chicago 5, Illinois



# WRITE FOR

**FREE**

## Hassall decimal- equivalent wall chart

# DECIMAL EQUIVALENTS

$\frac{1}{32}$	.0156	$\frac{1}{64}$	
$\frac{1}{16}$	.0312	$\frac{3}{64}$	.5156
	.0469	$\frac{5}{64}$	.5312
	.0625	$\frac{7}{64}$	.5469
	.0781	$\frac{9}{64}$	.5625
	.0937	$\frac{11}{64}$	.5781
	.1094	$\frac{13}{64}$	.5937
	.1250	$\frac{15}{64}$	.6094
	.1406	$\frac{17}{64}$	.6250
	.1562	$\frac{19}{64}$	.6406
	.1719	$\frac{21}{64}$	.6562
	.1875	$\frac{23}{64}$	.6719
	.2031	$\frac{25}{64}$	.6875
	.2187	$\frac{27}{64}$	.7031
	.2344	$\frac{29}{64}$	.7187
	.2500	$\frac{31}{64}$	.7344
	.2656	$\frac{33}{64}$	.7500
	.2812	$\frac{35}{64}$	.7656
	.2969	$\frac{37}{64}$	.7812
	.3125	$\frac{39}{64}$	.7969
	.3281	$\frac{41}{64}$	.8125
	.3437	$\frac{43}{64}$	.8281
	.3594	$\frac{45}{64}$	.8437
	.3750	$\frac{47}{64}$	.8594
	.3906	$\frac{49}{64}$	.8750
	.4062	$\frac{51}{64}$	.8906
	.4219	$\frac{53}{64}$	.9062
	.4375	$\frac{55}{64}$	.9219
	.4531	$\frac{57}{64}$	.9375
	.4687	$\frac{59}{64}$	.9531
	.4844	$\frac{61}{64}$	.9687
	.5000	$\frac{63}{64}$	.9844
		$\frac{65}{64}$	1.0000

JOHN HASSALL INC. BROOKLYN 22, N.Y. SPECIAL NAILS - RIVETS - SCREWS

## New Die-Cut Stamping Method Announced

The Dayton Rogers Mfg. Co., Minneapolis 7, Minn., has announced a new method of producing die-cut stampings in small lots, assuring a high degree of flatness. In a number of cases, when blanks come from the blanking die, certain stresses and material brittleness (commonly referred



Illustration showing typical die-cut stamps produced by new Dayton Rogers method

## RAYMAC *Solid Carbide* DRILLS and REAMERS

Raymac drills cut hardened metal . . . do not burn or anneal. Feature operational speeds of 350 to 600 RPMs depending on size and hardness of metal.

Raymac solid carbide reamers are custom designed for individual jobs.

Write for catalog No. 12

# RAYMAC

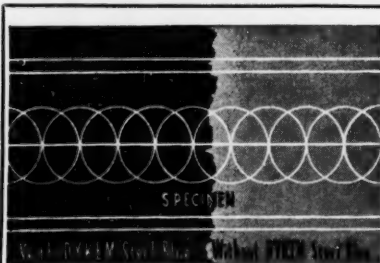
MANUFACTURING COMPANY INC.  
3729 CASS AVENUE, DETROIT 1, MICH.

to as stock temper) throw the blank out of flatness to such a degree that in some cases it is not usable. This is particularly noticeable on large blanks up to and including sizes of 6 x 12 inches or larger.

The Dayton Rogers process of producing flat blanks is said to be particularly advantageous in producing stampings used in the office machine industry and other types of stampings for such equipment where the free position of flat blanks has to be maintained to a high degree of accuracy.

## Pope Machine Company Now Subsidiary of Kling Brothers

Kling Brothers Engineering Works,  
Chicago manufacturer of steel fabri-



## DYKEM STEEL BLUE

### Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

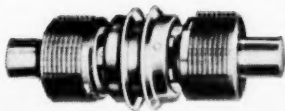
Write for full information.

**THE DYKEM COMPANY**

2301F NORTH 11TH ST. ST. LOUIS, MO.

# WHAT IS YOUR CLUTCH PROBLEM

There is no one stock answer to every power transmission control problem. That is why ROCKFORD clutch engineers can be of practical help in designing applications that will increase your product's efficiency — make substantial savings in cost — and reduce servicing downtime. Send a print or a description of your clutch need for their recommendations — based on many years of clutch application experience and the extensive ROCKFORD line of clutches, power take-offs and speed reducers.



## Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.



**ROCKFORD CLUTCH DIVISION**  
**Borg-Warner**  
300 Catherine St., Rockford, Illinois

# ROCKFORD CLUTCHES

cating machinery, has announced the purchase of all capital stock of Pope Machine Co., Inc., Seattle, Wash., maker of plate bending rolls. The Pope plant will continue to operate in Seattle as a subsidiary of Kling. New officers of Pope Machine Company, Inc., are Arthur H. Heist, president; William C. Pope and Carl W. Kling, vice presidents; Alfred G. Kling, secretary and treasurer; and L. W. Sistig, as-

sistant secretary and general manager of the company.

### Glen H. Matthews

Glen H. Matthews, sales manager of metal-working machinery, Mattison Machine Works, Rockford, Ill., died recently at the age of 62 years, following a seven-month illness. Born in

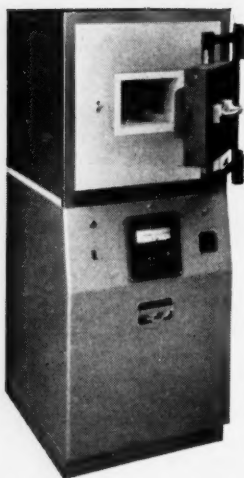
Ironton, Ohio, in 1891, Mr. Matthews was associated with Mattison for 29 years, beginning by sell-



Glen H. Matthews

ing wood-working machines throughout the country. He was particularly well-known in the Detroit area when auto body parts were made of wood. Later, Mr. Matthews was made sales manager of the Metalworking Division of Mattison and became well-known throughout the industry.

## A NEW FURNACE



• Write today for literature on complete line of Huppert furnaces and ovens in floor and table models.

**WITH A 2 YEAR  
ELEMENT GUARANTEE**

Range: 300° F. to 2,000° F.

### HUPPERT Model "K-R"

Electric Heat Treating

### FURNACE

For Precision Production  
and Lab. Work

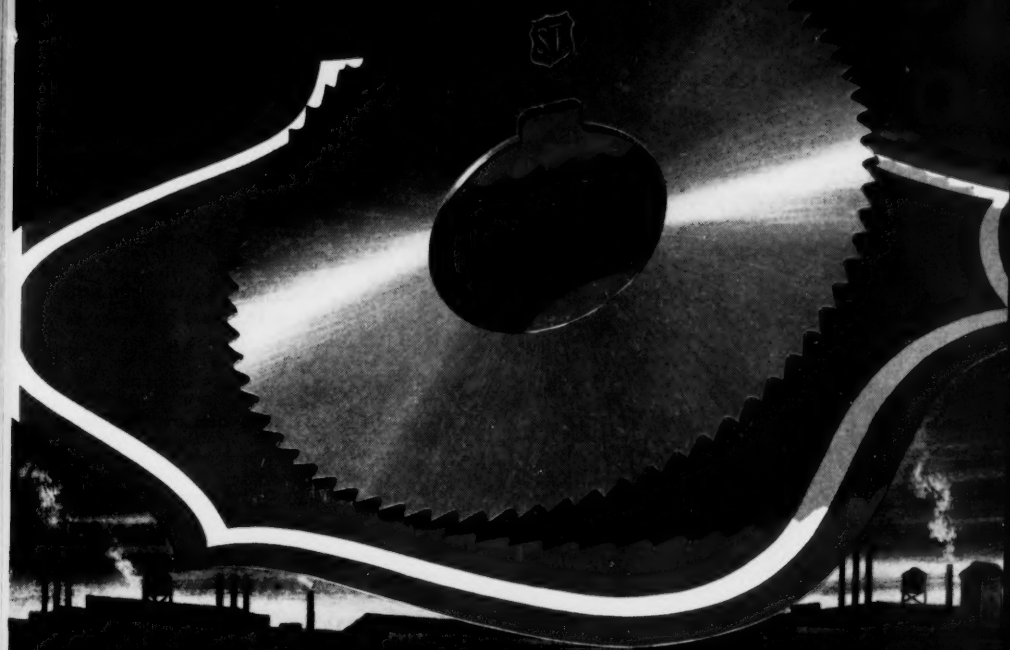
• This new Huppert Model "K-R" is ruggedly constructed to meet severest production requirements, yet offers a high degree of accuracy for laboratory experimentation. Complete with transformer, contactor, switch box, Huppert Infitrol and indicating electronic temperature controller. All connections factory installed. Shipped ready for operation.

Model No.	Inside Dimensions			K. W.	Prices—Single Phase	
	Wide	High	Deep		220 volt	440 volt
K-R 668	6"	6"	9"	2	\$ 710.00	\$ 770.00
K-R 6613	6"	6"	13"	3.5	800.00	860.00
K-R 8613	8"	6"	13"	5	990.00	1,050.00
K-R 10813	10"	8"	13"	8	1,240.00	1,370.00
K-R 10818	10"	8"	18"	12	1,450.00	1,580.00

**K. H. HUPPERT CO.** 6841 Cottage Grove Avenue,  
Chicago 37, Illinois

• Manufacturers of Electric Furnaces and Ovens •

*"STANDARD for  
tough jobs since 1881"*



*Red Shield says:*

Call your Industrial Supply Distributor for Shield Brand Slotting Cutters.

Specialized factory service available everywhere.

# STANDARD TOOL Co.

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FACTORY BRANCHES IN: NEW YORK • DETROIT • CHICAGO • DALLAS • SAN FRANCISCO

THE STANDARD LINE: *Twist Drills • Reamers • Taps • Dies • Milling Cutters • End Mills • Hobs • Counterbores • Special Tools*



Carl F. Toll (left), vice president of the Cleveland Advertising Club, is shown presenting the two machine tool award plaques to Walter K. Bailey, manufacturing vice president of the Warner & Swasey Company.

### Warner & Swasey Wins Machine Tool Ad Awards

Recently, the Warner & Swasey Co., Cleveland, Ohio, builder of precision machinery, was awarded two plaques by the Cleveland Advertising Club for its institutional and machine tool ads. This marked the second time in 1953 that the company had won awards for

such ads. Earlier in the year, Warner & Swasey won two "topper" awards for its institutional and machine tool ads from the National Industrial Advertisers Association. The company's machine tool ads have been appearing in MODERN MACHINE SHOP.

### Standard Machine & Tool Company Announces Expansion Program

H. J. A. Chambers, president and general manager, Standard Machine &

## How SQUARE HOLED SLEEVES SPEED UP TOOL-MAKING!

One of the most difficult problems in tool making can be solved easily and quickly with Sturdy Square Holed Sleeves. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small fraction of the cost of imperfect hand-made square holes. The Sturdy Square Holed Sleeve consists of a round sleeve with a perfectly square hole broached through the center. This hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

The Sturdy Square Holed Sleeve will save you many hours and many dollars in the making of boring bars, tool holders and other tools requiring square holes.

#### SLEEVES MADE IN FOLLOWING SIZES:

3-16, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 1"

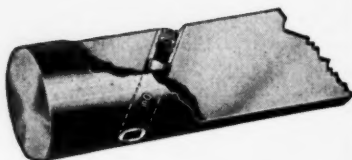
#### STURDY BROACHING SERVICE

23516 TELEGRAPH ROAD

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Patents Pending



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MODEL UN-450

*Heavy Duty  
Lathe*

## SCHAERER MODEL UN-450 HEAVY DUTY COPYING LATHES

Twin cross slides. Copies from cylindrical or flat template either longitudinally or cross. Twin slides permits rough turning and finish turning in the same operation in many instances. Swings 17-3/4" over bed, 9" over carriage, 20-5/64" over gap. Center distance 60". Spindle speeds 31.5 to 1400 R.P.M. Hydraulic copying attachment can be removed to permit use as a regular twin slide lathe when necessary. 10 H.P. motor drive to spindle. Separate motors for coolant and hydraulic pump. A production lathe built to tool room standards.

### OUTSTANDING FEATURES

Copies simultaneously in 2 directions; 49 longitudinal and cross feeds; All gears in headstock hardened and ground; Automatic carriage release when overloaded; Separate oiling systems for front and rear end bearings; Ball stop catch on cross slide guarantees accurate depth adjustment for thread cutting; Adjustable carriage stop for longitudinal turning.

- Guaranteed Service by Trained Staff
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Write for free illustrated brochure 100,  
or state your specific requirements.

Our headquarters in New York City

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## M. B. I. EXPORT & IMPORT LTD.

475 GRAND CONCOURSE, BRONX 51, NEW YORK



CABLE ADDRESS: MACHBUIL, NEW YORK

Tool Co., Ltd., Windsor, Ontario, manufacturer of special-purpose machine tools, has announced an extensive expansion program. The Staveley Coal & Iron Co., Ltd., England, has taken financial interest in Standard Machine. Mr. Chambers and A. R. Davidson, vice president of Standard Machine, have retained considerable interest in the organization and will continue the executive management of the company. For the Windsor plant of Standard Machine, a considerable investment in additional machine tool equipment will be made which will ex-

pand its local manufacturing production.

An additional plant is planned to be constructed near Preston to further increase the company's facilities. Arrangements have been made for an interchange of technical data between Standard Machine and the Archdale Company of England with the view to the production of equipment of highest standard of design and quality.

### Metal Carbides Corporation Constructs Additional Plant

Metal Carbides Corp., Youngstown, Ohio, has announced the construction of a new 40,000 square foot plant located on a 25-acre tract at 6001 Southern Boulevard in Youngstown. The new plant will be used to produce tungsten carbide metal, including tool tips, die nibs, bar stock, rings, bushings, and special shapes. The building is of steel, concrete, and brick construction and is air-conditioned throughout. Machinery and equipment are laid out to achieve maximum efficiency and economy of process flow. Ac-

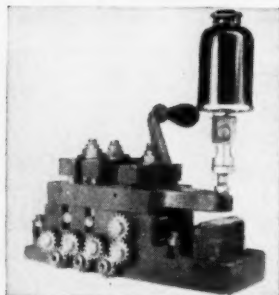
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SHOULDER SCREWS  
DOUBLE END JIG FEET  
SCREW TYPE JIG FEET  
PRESS TYPE JIG FEET  
FLANGED NUTS  
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**T-NUT & STUD SETS  
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**Northwestern**  
119 HOLLIER AVE., DAYTON 3, OHIO



(SHOWN WITH GEAR COVER REMOVED)

2" SIZE

**\$225.00**

**SPERMAN METAL SPECIALTIES 2199 EAST 21ST STREET  
BROOKLYN 29, NEW YORK**

Manufacturer of "MIGHTY MIDGET" Radius and Angle Dressers

## The "MIGHTY MIDGET" STOCK STRAIGHTENER

**ORDER DIRECT on our 10 day money back guarantee**  
The **ONLY** low cost stock straightener with all these features:

1. Built-in stock oiler.
2. Hardened and ground rollers.
3. All lower rollers gear driven, this cuts feeding pressure.
4. Front and rear Guide Rollers.
5. All bearings either ball, oil impregnated bronze or needle.
6. Straightens steel up to 2" wide by .048 thick, brass and aluminum thicker.
7. Supplied with hand crank which can easily be removed for power feed.

# THE PRIDE OF AN *Expert*



All the conscientious care and skill which the pride of an expert and years of experience can muster go into a Connecticut "Durakeen" broach. Then the correct cut follows as a natural result . . . even though the broaching machine operator just "operates."

Unless your job is such that you can sacrifice one or two zeros after the precision decimal point, it is folly to buy any but the finest broach. Specify Connecticut "Durakeen" to be sure . . . sure of more cuts per grind, more grinds per broach.

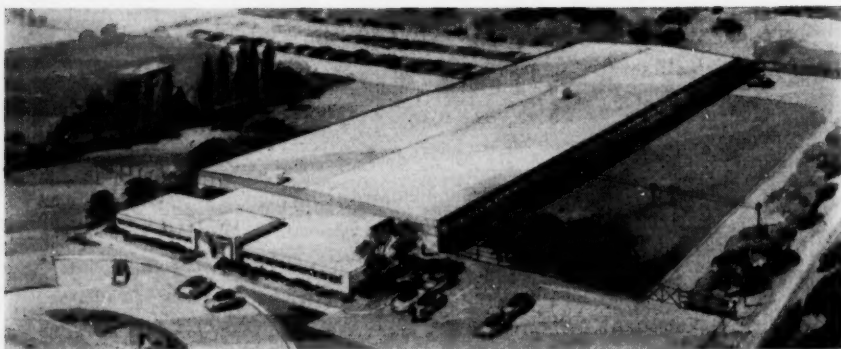
## CONNECTICUT **DURAKEEN** **BROACHES**

DURABILITY



WITH KEENNESS

**THE CONNECTICUT BROACH AND MACHINE COMPANY**  
4CB53A NEW LONDON, CONNECTICUT



Wash drawing of new plant of Metal Carbides Corp., Youngstown, Ohio

cording to the manufacturer, size and capacity of equipment will enable tungsten carbide metal to be mass produced on a scale not heretofore possible. In addition to tungsten carbide metal, tantalum carbide and titanium carbide will also be produced, as well as tungsten alloy heavy metal,

cermets, and high temperature alloys, all produced by powder metallurgy methods.

The new facility will be operated in addition to the main plant at 107 E. Indianola Avenue. Total manufacturing space of all plant facilities is approximately 100,000 square feet.



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for tell-all  
handbook and  
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"INDUSTRIAL  
MAGNIFIERS,  
HOW TO  
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ONLY  
**\$297<sup>56</sup>**

Stops automatic-  
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of cut. Automatic  
relief of saw blade  
on non-cutting  
stroke. 6" x 6" ca-  
pacity using 10" x  
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3" clutch pulley.  
Pulley speed 120

r.p.m. Coolant pump base. Swivel vise for angle cuts. All steel welded base and table. V-belt drive. Rigid frame. Gravity feed. Length gauge. Expanding clutch. 3-speed (90 to 130 r.p.m.) V-belt motor drive arrangement, \$32.21, less motors 1/2 H.P. 1725 r.p.m. motor recommended. Completely Motorized with Switch; Single Phase \$390.24; Three Phase \$397.03.

Order from your industrial supply distributor or order direct, giving name of your distributor.  
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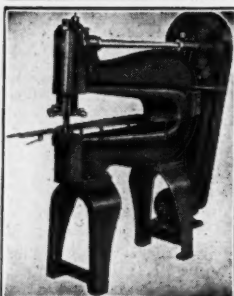
## Expansion Marks Colonial Broach's 35th Anniversary

In conjunction with the observance of its 35th anniversary, Colonial Broach Company has announced the addition of 6,000 square feet of floor space at its plant located at 21601 Hoover Rd., Detroit, Mich. In announcing the expansion, Arvid Lundell, president of the firm, said the additional space would be used for assembly and reconditioning of broach-

ing machines and equipment. This is the second straight year the company has found it necessary to increase its floor space.

During its 35 years in the broaching field, Colonial has outgrown three locations. Founded in 1918 in a shop on lower Woodward Avenue, the firm made its first move in 1926 when increased production made it necessary to move to a Butler Street building. In 1930, production again necessitated a move to larger quarters in a Joseph Campau Avenue building. After 12 years in that location, Colonial moved to the present plant.

## SAVAGE NIBBLING MACHINES



CAPACITIES  
UP TO  
 $\frac{3}{4}$ "

—  
ASK FOR  
FREE BULLETIN  
"I".  
—

### "NIBBLE YOUR COSTS"

FOR TUBE SLOTTING, TUBE SHAPING AND  
FAST AND ACCURATE CUTTING OF FLAT  
SHEETS BY TEMPLATE OR TO A SCRIBED LINE

### W. J. SAVAGE COMPANY

Knoxville

Since 1885

Tennessee

PIONEER MFRS. OF NIBBLING MACHINES

## Philip McKenna Dually Honored by A.S.M.E.

Philip M. McKenna, president of Kennametal Inc., Latrobe, Pa., received the Holley Medal awarded by the American Society of Mechanical Engineers at its annual meeting held recently in New York. The award is made on occasion for a "great and unique act of genius of an engineering nature" that has "accomplished a great and timely public benefit." Mr. McKenna received the Medal on December 2 for his "research, development, and application of cemented carbide compositions which have contributed so much to the art and science of metal cutting."

Mr. McKenna, who is also national

## WALTHAM SUB-PRESSES ... for precision work



Exact alignment and constant precision can be maintained throughout life of die. Made in 9 sizes. Babbitt bearing is tapered on outside and can be forced downwards. This reduces inside diameter to fit plunger when latter becomes worn through use.

Write for further information.

**WALTHAM MACHINE WORKS**



WALTHAM,  
MASS.





## What do *you* look for in a Tap, Mr. Johnson?

That will be "performance-ability" . . . something that you cannot see at first glance.

This has been built into the tap through proper selection and heat treating of the tap material, and the precision processes of machining the tap . . . processes that challenge the statement so often heard, "taps are all alike." That's why it pays to specify —

## Hanson-Whitney...

### the HANSON

Threading Processes  
For Complete  
Coordinating  
Responsibility

The Machine Tools  
The Cutting Tools  
The Measuring Gages

Through the Hanson Process . . . the original method of finishing after hardening . . . Hanson-Whitney has for 34 years produced a quality line of precision taps. We have never manufactured cut thread or unfinished taps.

Yes, Mr. Johnson, that's why Hanson Process Taps give you the dependable day-in, day-out production performance recorded on your cost sheets. Naturally, the right tap for the specific job is essential. Ask the Hanson-Whitney representative for his recommendations.

HANSON-WHITNEY DIVISION of the WHITNEY CHAIN CO.

160 Bartholomew Avenue, Hartford, Connecticut, U. S. A.



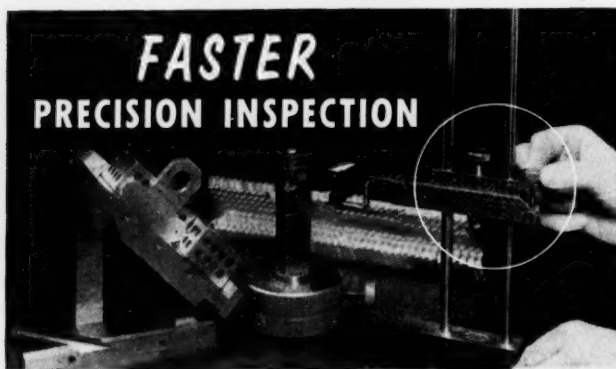
Our "Mr. Johnson" typifies the thousands of practical machinists in America. You'll find him in your shop. Ask him what he thinks about H-W Taps.

SHW:BB

January, 1954

MODERN MACHINE SHOP 265

chairman of the Gold Standard League and an authority on monetary economics, was selected by the society to deliver its Towne Lecture at the society's annual meeting. The lecturer each year is an outstanding leader in the field of management, economics, or business, who reveals his experience as related to the scientific method in industry or business. This marks the first time that a Holley Medal Winner has been also the Towne Lecturer.



## **TTC® INDICATOR HEIGHT GAGE**

Inspectors—toolmakers—save time and money. Get faster, more accurate inspection with the new, versatile Tietzmann Indicator Height Gage. Positive final adjustments in millionths easily and quickly made with one hand. No more eyestrain doing scribing work. Supplied with indicator holder and scribing attachment in three sizes.

Adjustable inspection block eliminates trial and error readings of the height gage. Adjustable in millionths through a range of .250" vertically. 1 3/4" anvil quickly raised and lowered with a micrometer thread screw.

Use both products together for accurate production inspection. Write for Bulletins 140 and 150.

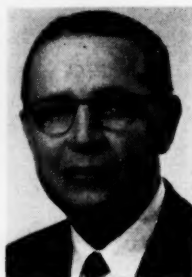
**TIETZMANN TOOL CORPORATION**

**316 N. MAIN STREET • ENGLEWOOD, OHIO**

## **Motch & Merryweather Names Cutting Tool Sales Manager**

Clare R. Kubik, vice president of administration, The Motch & Merryweather Machinery Company, has announced the appointment of A. J. Snyder as sales manager of the Cutting Tool Sales Division. Mr. Snyder was formerly vice president and general manager of The Morse Twist Drill Co., New Bedford, Mass. He recently served with the U. S. Government. Mr.

Snyder will direct the distribution of cutting tools throughout the Motch & Merryweather territory



A. J. Snyder

with offices in Cleveland, Detroit, Pittsburgh, and Cincinnati.

The Cutting Tool Sales Division represents leading manufacturers of cutting tools and also sells the cutting tools manufactured by Motch & Merryweather in its Euclid Plant at 1250 E. 222nd St., Cleveland.



**WHY WAIT FOR SPECIAL TAPS?**

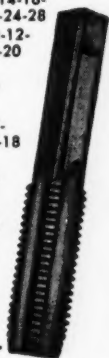
*... Has them IN STOCK  
for IMMEDIATE DELIVERY!*

**HIGH SPEED**

**SPECIAL**

**RIGHT HAND TAPS**

SIZE	THREAD	SIZE	THREAD	SIZE	THREAD
4	32-48-60-64	7/16	12-16-18-22-24-27-28-30-32-36-40	1-5/8	5 1/2-8-10-12-13-16-18-20-24
5	30-32-36-48-80	1/2	12-14-16-18-22-24-26-27-28-30-32-40	1-11/16	10-12-14-16-18-20-24
6	36-40-48-56-60	9/16	16-20-24-27-28-30-32-40-48	1-3/4	8-10-12-14-16-18-20-24
7	32-40	5/8	12-14-16-20-24-27-28-32-36-40	1-13/16	8-10-12-14-16-18-20
8	24-30-36-38-40-44-48	11/16	11-16-18-20-24-27-28-30-32	1-7/8	8-10-12-14-16-18-20-24
9	24-28-32-40	3/4	9-11-12-14-18-20-24-26-27-28-32	1-15/16	8-10-12-14-16-18-20-24-28
10	28-30-36-40-48-64	13/16	10-14-18-20-32	2	4 1/2-8-10-12-16-18-20
12	20-28-32-36	7/8	10-12-16-18-20-24-27-28-32	2-1/16	12-14
14	20-24-28	15/16	8-9-10-12-14-16-18-20-24-32	2-1/8	12-16-20
1/16	60-64	1	10-12-16-18-20-24-27-32-40	2-3/16	12-16
5/64	72	1-1/16	12-14-16-18-20-24	2-1/4	4 1/2-8-12-14-16-18
3/32	48	1-1/8	8-10-14-16-18-20-24-32	2-5/16	12-18
7/64	48-56	1-3/16	8-10-12-14-16-18-20-24	2-3/8	12-16-18
1/8	32-40	1-1/4	8-10-14-16-18-20-24-32	2-7/8	8-10-12
5/32	32-36-40	1-5/16	12-14-16-18-20-24-32	3	8-12-16
9/64	36-40	1-3/8	8-10-14-16-18-20-24	3-1/4	8-12-16
11/64	36	1-7/16	8-10-12-16-18-20-24	3-1/2	8-12-16
3/16	20-24-32	1-1/2	8-10-14-16-18-20-24-28	3-7/8	6
13/64	32	1-9/16	18-20-24	4	8-12
7/32	24-28-32				
1/4	18-24-26-27-30-32-36-40				
5/16	16-20-22-27-28-32-40				
3/8	12-16-18-20-27-28-32-36-40-48				



**HIGH SPEED LEFT HAND TAPS**

SIZE	THREAD	SIZE	THREAD	SIZE	THREAD
0	80	3/8	16-24-32	1-3/8	6-8-10-12-16-18-20-24
1	56-64-72	7/16	14-20-28	1-7/16	8-10-12-14-16-18-20
2	56-64	1/2	12-13-20-28	1-1/2	6-8-10-12-16-18-20
3	56	9/16	12-18-20-24	1-9/16	8-10-12-16-18-20
4	32-36-40-48	5/8	11-12-18-20-24	1-5/8	8-10-12-14-16-18-20
5	40-44	11/16	11-16-24	1-11/16	8-10-12-14-16-18-20
6	32-36-40	3/4	10-16-18-20	1-3/4	8-10-12-14-16-18-20
8	32-36-40	13/16	16	1-13/16	8-10-12-14-16-18-20
10	24-30-32-40	7/8	9-12-14-18-20	1-7/8	8-10-12-14-16-18-20
12	24-28-32	1	8-12-14-16-18-20	1-15/16	8-10-12-14-16-18-20
1/4	20-28-32	1-1/8	7-12	2	4 1/2-10-12
5/16	18-20-24-28-32	1-1/4	7-12-16-18		

**• SPECIAL AND LEFT HAND DIES IN STOCK**

Prices on Application—We are always adding new sizes

**NOTE:** Oversize—Undersize—Metric—64th—and 32nd Size Taps Available for Quick Delivery.

**DEALER INQUIRIES INVITED**

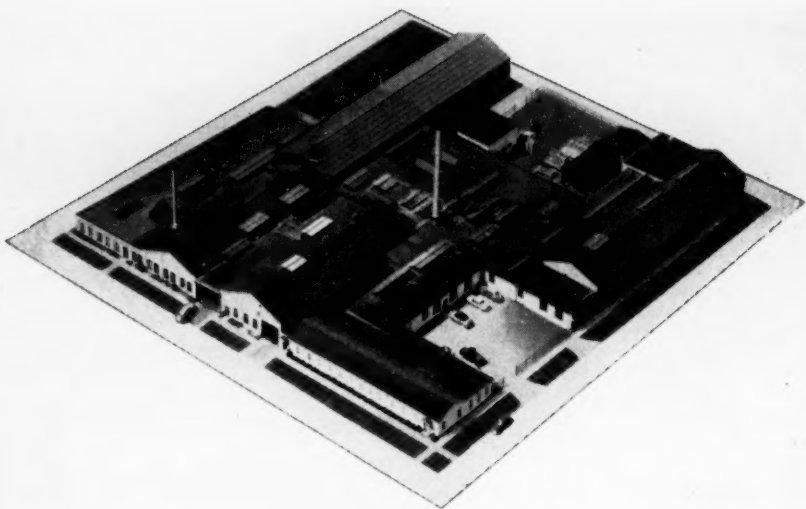
**SID TOOL COMPANY, INC.**

CUTTING TOOL SPECIALISTS

126 LAFAYETTE STREET • NEW YORK 13, N. Y.

• Are you on our monthly mailing list? Write Dept. M.

PHONE: ME 3-6373



Aerial view of new plant of Pines Engineering Co., Inc., Aurora, Illinois

#### 400 Engineering Executives Attend Pines Open House

More than 400 engineering and production executives from all parts of the United States and Canada, interested in production bending techniques, recently attended an open house held by Pines Engineering Company, Inc., at its Aurora, Illinois, plant. The occasion marked the completion of an extensive plant modernization and improvement program which began early in 1952. Facilities at the Pines plant,

which have been gradually expanded during the past five years, now include a sizable battery of well-known precision metal-cutting and fabricating machines. The plant today occupies a total of 70,000 square feet, an increase of 50 per cent since 1950. Color dynamics are employed extensively throughout the interior of the plant.

In addition to a plant tour, the visitors were given an inside story on several of the latest developments in cold forming metal by production bending machine methods.



Air-O-chek  
GUN

COMPRESSED AIR  
ECONOMY

In machine shop and foundry clear away chips, dust, dirt and surplus material quickly . . . AND SAVE through low initial cost, superior performance, low maintenance. Air-O-chek air guns are of simple design, sturdy construction and are easy to use.

Write for full details

AIR-WAY PUMP & EQUIPMENT CO.

1046 N. Kilbourn Ave. Chicago 51, Ill.

# ELECTRICAL CONTROLS FOR INDUSTRY

## NEUTROL

### ELECTRO-MAGNETIC CHUCK CONTROL



50 to 15,000 Watts  
... 60 to 20,000 Sq.  
In. Chuck Area.

Releases and demagnetizes work pieces simultaneously. No time lost. No damage to work or chuck face. Protects chuck from voltage surges. Speeds production.

### ELECTRO-MATIC RECTIFIER



50 Watts to 40  
Kilowatts

Engineered for dependable power conversion in constant year after year service. Quiet and efficient. For all industrial applications.

## NEUTROLATOR

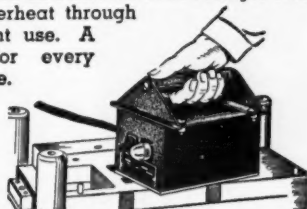
### NEUTROL CHUCK CON- TROL and HOLDING POWER REGULATOR



Combines the advantages of NEUTROL with the benefits of absolute voltage regulation. Control of holding power is infinitely variable through entire dial range. Best holding power predetermined for an operation is automatically repeated. Assures true parallel grinding. Manual or automatic control models.

### ELECTRO-MATIC A.C. DEMAGNETIZER

Demagnetizes dies, punches, cutters, tools that have been magnetized from any source. Works by simple contact. Operates on standard A.C. voltage. Will not overheat through constant use. A size for every purpose.



**All Models Fully Warranted**

**Special Models Engineered to Meet Every Need**  
**Your Inquiries Will Be Promptly Answered Without Obligation.**

**ELECTRO-MATIC PRODUCTS CO.**

**2235-37 N. KNOX AVE., CHICAGO 39, ILLINOIS, U. S. A.**



New plant of Hoffman Co., York, Pennsylvania

### Hoffman Occupies New Plant

Hoffman Company has announced that its recently completed plant located at 2580 W. Philadelphia St., York, Pa., is now in full production. The new plant has twice the floor area of former operations; however, through more efficient shop planning and improved shop practices, the company expects to more than triple the output of metal baskets, trucks, racks, and other materials handling equipment in its "Roll-Way" line.

### Lewis K. Sillcox Elected A.S.M.E. President

Lewis K. Sillcox, honorary vice-chairman of the board of The New York Air Brake Company, was elected president of the American Society of Mechanical Engineers for 1954 at the society's 74th annual meeting held recently at the Statler Hotel in New York. The election of five regional vice presidents and two directors-at-large was also announced. The new president succeeds Frederick H. Blac-

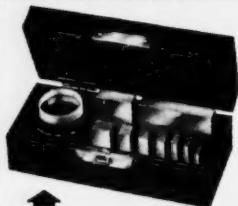
## ULTRA-CHEX GAGE BLOCKS

*for Every Need!*

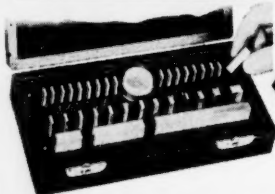
Supplied in one Superior Accuracy

**5 MILLIONTHS ± ACCURACY**

**Quick Delivery on Small Standard Sets**

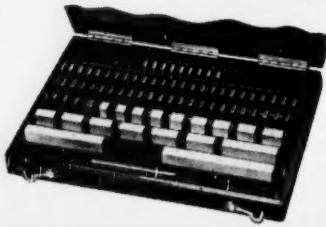


**9 Block Set \$22.50**  
OPTICAL PARALLEL **\$5.00**



**34 Block Set \$125.00**  
INCLUDING OPTICAL PARALLEL

**All Sets at "Money Saving Prices" due to Mass Production Methods.**



**82 Block Set \$275.00 Complete**

*This Set will supply the needs of any discriminating shop that must work to gage-block precision.*

*Dealers: Here's a real profitable line!*

**WRITE FOR FULLY ILLUSTRATED CATALOG**

**GEORGE SCHERR CO., Inc.**

**200-MM LAFAYETTE ST. • N.Y. 12, N.Y.**





# SANFORD

## SURFACE GRINDER

### MODEL MG

**For Dry or Wet\* Grinding!**  
**PRECISION • SPEED • SENSITIVITY**

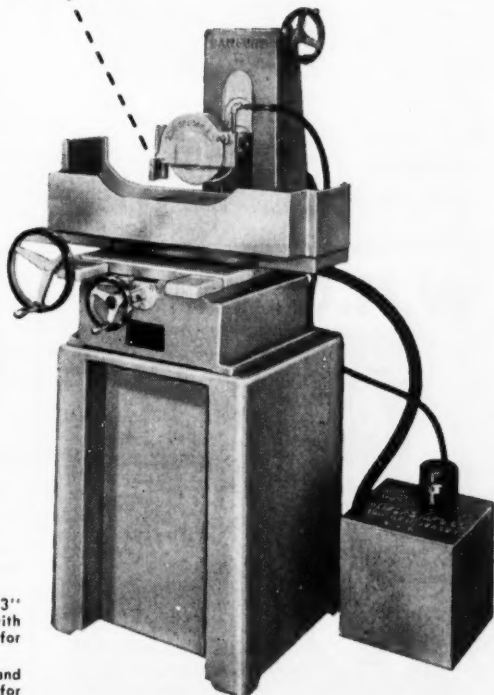
Built by manufacturers who concentrate on small grinders only, each Sanford Grinder is an individual project of time tested and proved basic design. Although modest in price, no quality undermining shortcuts are employed to reduce manufacturing costs. Constant repeat orders prove its acceptance.

This sensitive machine grinds to micro-inch accuracy with no vibration, with maximum dimensional stability. Here's why:

- Transverse ways are double Vee (VV) Meehanite inserts instead of flat surfaces which depend upon unstable jibs for alignment and accuracy.
- Needle, Ball and Oilite Anti-Friction bearings are used throughout.
- Alignments are electronically checked for accuracy.
- Precision slides are ground, lapped and hand spotted.
- Dials are large and legible.

**SPECIFICATIONS** — 8 $\frac{3}{4}$ " transverse — 13" longitudinal — 12" vertical under 7" wheel with Adapter. Approximate weight 630 lbs. Send for illustrated bulletin.

Replacement parts, special attachments and reconditioning facilities are available. Send for price list.



\*With optional equipment

# SANFORD

**MANUFACTURING CORP.**

1022 Commerce Ave., Union, N. J.

## Adjustable Automatic Stock

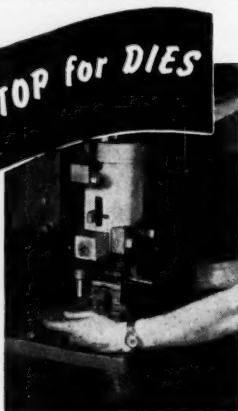
**FEED STOP for DIES**

### Dahlstrom AUTOSTOP

No drill jig . . .  
no slotting . . .  
no milling.  
Specify whether  
for use on blank-  
ing, progressive  
or compound dies.  
Mounts on  
stripper plate  
in 15 minutes.  
\$1.75 each;  
\$18 doz.

Write for pamphlet.

**BRANCH**  
**MFG. CO.**  
NORTH BRANCH,  
MINNESOTA



**\$1.75**

**W.H.O.\* SAYS:**

*"Don't have FITS  
over FASTENERS,  
have fasteners  
that fit."*



For the finest in  
milled-from-the-bar  
cap screws, set screws,  
coupling bolts  
and milled studs

**DON'T GET STUCK, STICK  
TO THE ONES MADE BY**

**\* Wm. H. Ottumiller co. YORK, PA.**

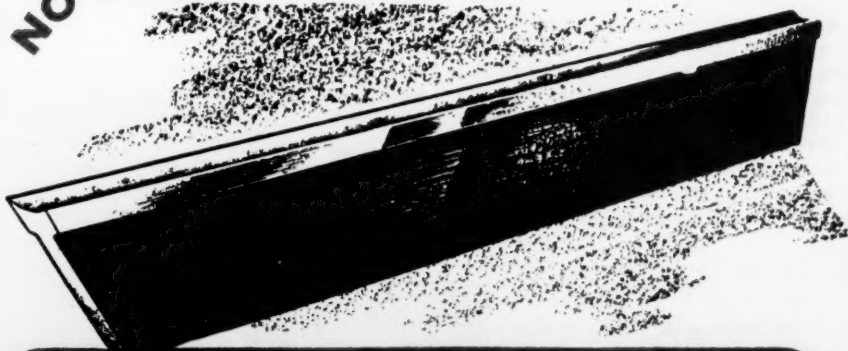
kall, president and treasurer of The Taft-Peirce Mfg. Co., Woonsocket, Rhode Island.

The regional vice presidents elected are Willis F. Thompson, vice president, Westcott & Mapes, New Haven, Conn.; Professor William G. McLean, head of the Department of Mechanics, Lafayette College, Easton, Pa.; Thompson Chandler, chemical engineer, Carbide & Carbon Chemical Corp., South Charleston, W. Va.; Vernon A. Peterson, district manager, Elliott Co., Los Angeles, Calif.; and Professor Clifford H. Shumaker, director of the Institute of Management, Southern Methodist University, Dallas, Texas. Elected directors-at-large are Frank L. Bradley, plant engineer, Forstmann Woolen Co., Passaic, N. J., and Robert B. Lea, coordinator of exports, Sperry Corp., New York, New York.



"Your wife will probably wonder why you stayed down at the machine shop so late—you can tell her you were run over by a car."

**NO OTHER CUT-OFF BLADE LIKE THIS!**



**Luers Cutting-off Blade**

Empire Tool Co. is the **LEADER** in cut-off blade developments—backed by twenty years' experience in cut-off blade manufacture.

Cut-off blades are tools subject to conditions different from those of other tools and will perform most efficiently only when specialists' recommendations are followed.

Available from stock are blades of four types of high speed steels developed to meet the demands of cut-off operations. And on short notice you can get blades of cast alloys and tungsten carbide.

Made under license issued by John Milton Luers Patents, Inc.

Made in U.S.A.

**EMPIRE**

**8776 GRINNELL AVE.**

**TOOL COMPANY**

**DETROIT 13, MICHIGAN**

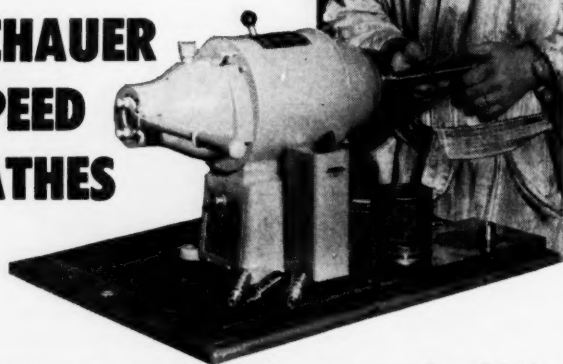
## Metal-Working News in Brief

At a stockholders' meeting of Micro-matic Hone Corp., Detroit, Mich., **William H. Harris, Jr.**, was elected to the board of directors, filling a vacancy created by the resignation of **Harvey C. Fruehauf**. **Kirke W. Connor**, **Hubert E. Hartman**, **William E. Dugan**, **A. J. Prentice**, **Herbert J. Woodall**, and **Don S. Connor** were re-elected to the board.

**Scully-Jones & Co.**, Chicago, Ill., has named seven stocking distributors in the state of Michigan. The new distributors are **Bobier Tool Co.**, 1838 S. Dort Highway, Flint, Mich.; **Industrial Equipment & Supply Co.**, 211 W. Main St., Benton Harbor, Mich.; **Grand Rapids Supply Co.**, Grandville & Wealthy, S.W., Grand Rapids, Mich.; **Kendall Hardware-Mill Supply, Inc.**, 1918 King Highway, Kalamazoo, Mich.; **Sturn Tool Supply Co.**, 705 E. Main St., Lansing, Mich.; **Lake-shore Machinery & Supply Co.**, 400 W. Laketon Ave., Muskegon, Mich.; and **Mahar Tool Supply Co.**, 1708 N. Michigan Ave., Saginaw, Michigan.

## DO LAPPING AND A ZILLION OTHER JOBS ON

## SCHAUER SPEED LATHES



Schauer Speed Lathes handle many secondary finishing operations—lapping, filing, deburring, polishing, etc.—on metal and plastic parts, *faster, at less cost*. Thousands are in use on an almost *unlimited* variety of jobs.

Many sizes and models with holding devices to fit the application. Speed *your* production with Schauer Speed Lathes. Write today for Bulletin 500.

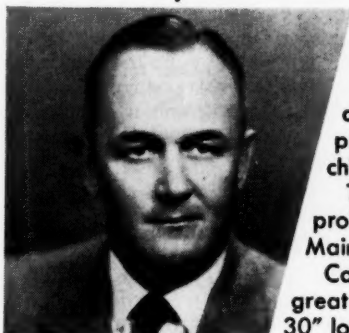
**SCHAUER MANUFACTURING CORP.**

**4501 Alpine Ave., Cincinnati 36, Ohio**

— o —

Firth Sterling, Inc., Pittsburgh 30, Pa., has announced the establishment of a new office located at 200 North Ave., Westfield, N. J., that combines the Philadelphia and New York offices at one headquarters. **Howard M. Dawson** is manager of the mid-eastern district. The Ohio district office of Firth Sterling has changed its address to 2250 Euclid Ave., Cleveland 15, Ohio. **Stuart A. Smith** is serving as Ohio district manager.

# he sets 'em up...



## *for speed and accuracy!*

Erickson field engineers, like Dick Butts above, are trained to get the utmost in production and accuracy from your machine tools.

Typical is the solution to a "precision" problem at Saco-Lowell Shops of Biddeford, Maine . . . manufacturers of textile machinery.

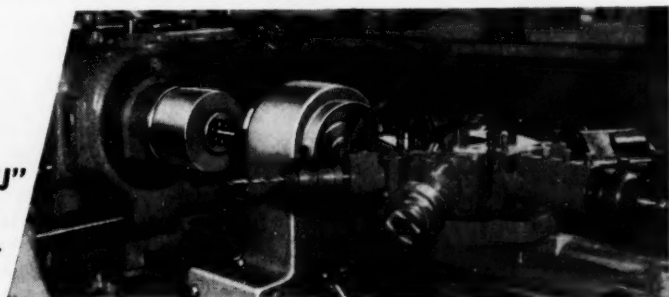
Cause of lost accuracy was an unusually great diameter-to-length ratio on rolls 24" to 30" long. They must fit perfectly when threaded together on spinning frames up to 52' long. Machining consists of drilling, reaming, and tapping to a .004" TIR from thread P.D. to roll O.D.

Accuracy is now rigidly held by use of Erickson Speed Chucks as both headstock and steady-rest. A report from Saco-Lowell states:

"By use of Erickson chucks on both spindle and auxiliary support, we increase quality, reduce handling time and reduce set-up time when changing to other sizes."

Erickson's technical staff can develop the correct solution to your tool and work holding problems.

**Write  
for  
Catalog "J"  
Today**



## **ERICKSON TOOL COMPANY**

**2303V HAMILTON AVE.**

**CLEVELAND 14, OHIO**

**COLLET CHUCKS . TAP CHUCKS . FLOATING HOLDERS  
EXPANDING MANDRELS . AIR CHUCKS . SPEED INDEXERS**

### Metal-Working News in Brief

**Louis Polk**, president of The Sheffield Corp., Dayton, Ohio, has been named a director of the American Society of Mechanical Engineers. Mr. Polk has long been active in engineering and national preparedness work.

— o —

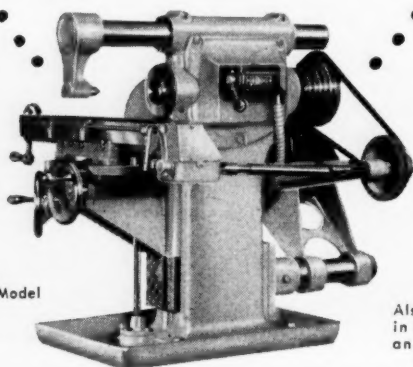
**George D. Hooper**, formerly chief engineer and plant manager of National Machine & Tool Co., Jackson,

Mich., has joined the Carboly Department of General Electric Co., Detroit 32, Mich., as a development engineer in the magnet materials and process development unit. **Carl A. Moeller**, former supervisory training instructor in the Detroit Ordnance District, has also joined Carboly as an instructor in the customer training school, replacing **Lloyd Mattson** who transferred to Carboly's Edmore permanent magnet plant.

— o —

STURDY  
ACCURATE — ECONOMICAL  
**BURKE**  
BENCH MILLERS

are so amazingly versatile they can almost reproduce themselves. Thousands in service in tool, school, development, repair and mass production shops.



Burke No. 4  
Power Feed Model  
illustrated.

Also available  
in hand-feed  
and universal  
models.

*Send for complete data on models,  
specifications and accessories.*

**THE U. S. BURKE MACHINE TOOL DIV.**

Brotherton Road 3, Cincinnati 27, Ohio

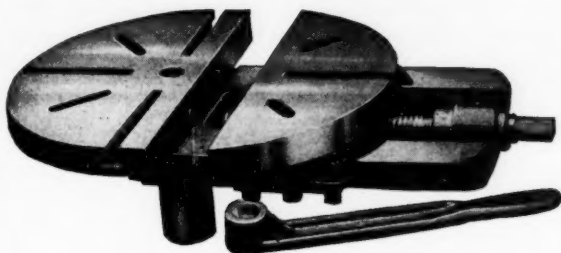
**Jones & Lamson Machine Co.**, Springfield, Vt., has announced the establishment of a Market Research & Sales Analysis Division, with **N. R. Kidder** as division manager. Mr. Kidder was formerly associated with the Department of Army Operations Research Office where he served as civilian research consultant.

— o —

**Lempco Products, Inc.**, Bedford, Ohio, has announced the appointment of **H. B. Van Auken** as assistant chief engineer and **Frank Vasarhelyi** as chief tool engineer. Mr. Van Auken will assist **V. R. Roy**, who is chief engineer for the company.



# Try the MODERN SAFETY DRILL TABLE



*Under Our*  
**FREE  
TRIAL  
OFFER**

*For Faster, SAFER Work  
in Your Maintenance Department*

Combines a drill table, a vise, a set of parallels and V block. No more lost fingers, from hand held jobs that slip. No more 30 minutes set-ups for a 1 minute drilling operation. Made in 6 sizes, from 8" to 28" dia. We guarantee each Safety Drill Table will save its cost on labor alone in 6 months, to say nothing of plant down time when vital maintenance is delayed even a few minutes.

**WRITE FOR FREE FOLDER**

Shows many typical set-ups, and use on radial drills. Complete specifications on all models. Covers **MONEY BACK GUARANTEE** and **30 DAY FREE TRIAL OFFER**.



**MODERN MACHINE TOOL CO.**  
*Jackson, Michigan*

### Metal-Working News in Brief

**H. M. Scherling** has been appointed representative in Minnesota and western Wisconsin by the Detroit Die Set Corporation. Mr. Scherling will maintain headquarters at 22 Westwood Road, Minneapolis 16, Minnesota.

— o —

**Anton Smit & Co., Inc.**, New York, N. Y., has announced the appointment of **Daniel S. de Rimini** as general sales

manager. **Frans Ls. Meyjes** has been named vice president in charge of production and director of the applications engineering division, and **Oscar A. Tellier** has been elected treasurer of the company.

— o —

**Wesson Metal Corp.**, Lexington, Ky., and **Wesson Co.**, Detroit, Mich., have announced the creation of a new public relations and advertising department to be headed by **Gregg Manchester**.

The new department, to be located in the Ferndale office of **Wesson Company**, will coordinate the public relations and advertising programs of **Wesson Metal Corporation**; **Archer & Smith, Inc.**; **Wesson Multicut Company**; **Wesson Tool Company**; and **Wesson Company**.

— o —

**Dorman Tool Co.**, 14 Julian Place, P. O. Box 196, Elizabeth, N. J., has been appointed exclusive distributor in the northern New Jersey and metropolitan New York area for the **Bec-kett-Harcum** line of drilling and tapping machines, air pressure drill press feeds, and automatic reversing motors as well as **Thriftmaster** drill heads.

For  
**"On the Spot"  
DELIVERY** ... from **STOCK**  
*Chicago*  
**"V"--BELT DRIVES**

Over 100,000 fractional H.P. pulleys are carried in stock for your immediate delivery.

Sizes range from 1 1/2 to 14" in diameter for "A" - "B" and "O" section V-belts. Make our stockroom your warehouse when you specify  
*Chicago*  
**V-BELT DRIVES.**



**Construction:** All pulleys are Die Cast from the best grade of zinc base alloy, then are accurately finished to give you years of satisfactory service.

For complete information write for Catalog No. 6752.

*Chicago* **DIE CASTING MFG. CO.**  
2510-14 WEST MONROE STREET  
CHICAGO 12, ILLINOIS

**NOTHING  
COMPARES  
WITH IT FOR  
TRIMMING  
FORMED  
PARTS!**



**FRICION  
SAWING with**

## *Tannewitz* **HIGH SPEED BAND SAWS**

Tremendous savings of time and money are effected in trimming formed parts with Tannewitz High Speed Band Saws, for not only are the cuts made fast and smoothly, but in most cases no jigs or rests of any kind are required. Sheets of both soft and hard steel, non-ferrous metals and many other materials are also handled to great advantage by this method and it is perfect for trimming castings. By all means get the complete facts and learn of the many opportunities for boosting production and lowering costs that Friction Sawing with Tannewitz High Speed Band Saws offers.



**The TANNEWITZ WORKS** GRAND RAPIDS MICHIGAN

**WRITE FOR FREE COPY OF FRICTION SAWING**

### Metal-Working News in Brief

Thor Power Tool Co., Aurora, Ill., has announced the appointment of **John L. MacDonald** as manager of its Newark, New Jersey, factory branch office. Mr. MacDonald was formerly an industrial tool service engineer for Thor in the Boston district.

— o —

**Edward Van der Pyl**, director of equipment engineering at Norton Co., Worcester, Mass., has retired after a distinguished Norton career which be-

gan in 1909. Mr. Van der Pyl will still be available as a consultant to the company.

— o —

**Skil Corp.**, Chicago 30, Ill., has announced an address change for its branch office in New York to 2800 Park Avenue; in Baltimore to 2323 Greenmount Avenue; in Portland to 5616 N. E. Glisan Street; and in Indianapolis to 1620 E. Riverside Drive.

— o —

**Carl W. Schwendener** has been appointed factory manager of the Elgin

Division of Flexonics Corp., Maywood, Ill. **Fred A. Abben**, formerly factory manager of the company's Savanna, Illinois, division, has been named industrial relations manager, and **Richard Benton** has been appointed factory manager of the company's plant at Rock Falls, Illinois.

— o —

**Thomas A. Johnson**, a division field engineer in northern Ohio since 1952, has been appointed supervisor of sales for the abrasive division of Elgin National Watch Co., Elgin, Ill. Mr. Johnson will supervise the abrasive division's field-selling force from the company's headquarters at Elgin, Illinois.

## NEED HYDRAULIC PUMPS IN A HURRY?



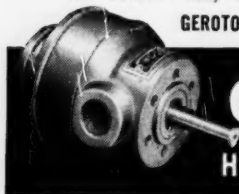
**Now...you can get hydraulic pumps WHEN YOU NEED THEM!**

Gerotor can deliver from stock . . . immediately . . . any of their standard hydraulic pumps, covering ranges as shown in the table. If you have pump requirements and need immediate service . . . call, wire or write Gerotor today.

Type Pump	G.P.M. Range	P.S.I. Range	R.P.M.
"B"	4—1.5	0—1600	1800
"QDH"	3—12	0—1200	1200
"O"	20—40	0—1000	1200

Whatever your need in hydraulic pumps or motors, consult the Gerotor May engineers. Write for free literature.

GEROTOR MAY CORP., BOX 86, Baltimore 3, Md.



**GEROTOR**  
HYDRAULIC PUMPS & MOTORS

# Be Brighter than Competition!...



**BETTER FINISHING** is your cue these days, to beat keener competition. Finer, faster *burring, cleaning, finishing, polishing in one operation* with Brightboy saves time, increases profits. Brightboy produces parts, assemblies and finished products that look and *are* the *better* quality that brings you *bigger* sales.

Brightboy definitely brightens your profit picture because it gives you a refreshing, revolutionary concept of finishing — and applications which are far beyond the range of other methods. There are six

Brightboy textures, each consisting of a special-formula "cushioning" rubber binder and matched abrasive for an extensive range of finishing. The combination-action of *rubber and abrasive working together* not only gives you the finer surfacing that enables you to out-sell competition, but also *time savings up to 50%*.



WHEELS,  
STICKS,  
RODS,  
BLOCKS  
for machine  
and manual  
operations

## BETTER FINISHING DATA

is no further away than your regular dealer's. Ask him for the Brightboy Catalog Manual. Write us if he cannot supply you, or on any problem where finishing is involved.



*Better Finishing Data...  
Ways To Bigger Profits!*

**BRIGHTBOY INDUSTRIAL DIVISION  
WELDON ROBERTS RUBBER CO.  
95 No. 13th St. • Newark 7, N. J.**

*America's Pioneer Manufacturer of Rubber-Bonded Abrasives*



**FOR FINISHING ALL METALS, PLASTICS, WOOD, AND LAMINATED MATERIALS**

### Metal-Working News in Brief

Kurt Orban Co., Inc., New York, N. Y., has announced the appointment of **International Machinery Co.**, New Haven, Conn., as sole distributor of its line of German precision machine tools in southern New England.

— o —

**Lewis D. Spence**, a retired executive of the Brown & Sharpe Mfg. Co., Providence 1, R. I., died recently at 73

years of age. Having been associated with the company since 1898, Mr. Spence was an outstanding authority on the construction and use of automatic screw machines.

— o —

**White-Roth Machine Corp.**, Lorain, Ohio, has announced the appointment of **Motch & Merryweather Machinery Co.**, Cleveland, Ohio, as regional distributor for its BurrMaster Tumbling Machine, covering eastern Michigan,

Ohio, western Pennsylvania, Kentucky, and W. Virginia.

— o —

**Lamina Dies & Tools, Inc.**, Berkeley, Mich., has announced the appointment of **A. William Tilder** as sales manager of its Guide Pin and Bushing Division. Mr. Tilder was formerly vice president and general manager of Acromatic Tool Company.

— o —

**Raybestos-Manhattan, Inc.**, Passaic, N. J., has announced the appointment of **S. V. V. Hoffman** as district manager of its west coast sales district with headquarters in Los Angeles. Mr. Hoffman was formerly regional manager in Los Angeles.

**YESTERDAY'S PIONEER . . . TODAY'S LEADER**



Patent Applied for

## WELDON COUNTERSINKS and DEBURRING TOOLS

*With Single Cutting Edge*

**REVOLUTIONARY. . . . . CHATTERLESS!**

Greater ease in cutting is the outstanding feature of these new cutting tools—made for 82° angle countersinking and for 90° angle deburring operations. Have only a single cutting edge which prevents chatter. Both tools are regularly made for right hand cut. One trial will convince you. Special tools of this type made to order.

Write for  
further details

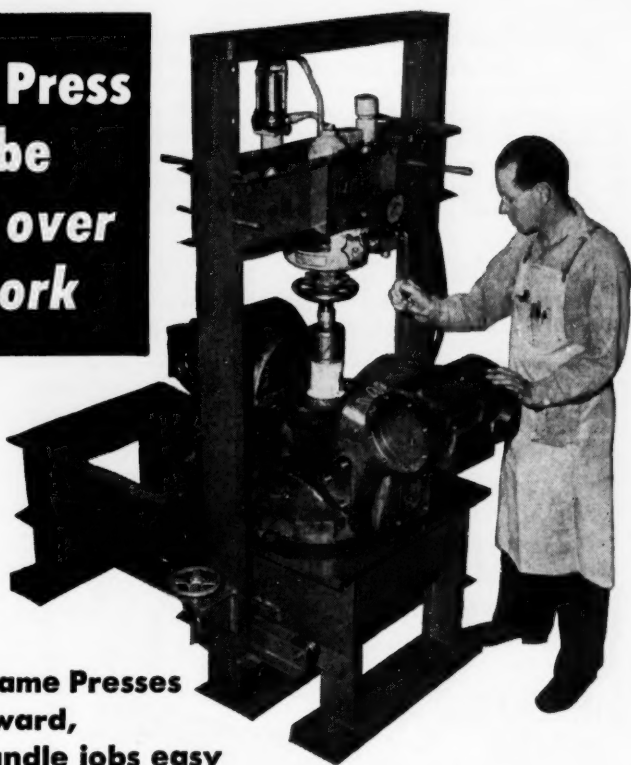
**Weldon Distributors throughout  
U.S.A. and Canada carry complete  
stocks to serve you.**

## THE WELDON TOOL COMPANY

3000 WOODHILL ROAD . . . CLEVELAND 4, OHIO



***THIS* Press  
can be  
moved over  
the work**



**DAKE**  
**Movable Frame Presses**  
**make awkward,**  
**hard-to-handle jobs easy**

Here is the hydraulic press you need for work on awkward, heavy parts, and for handling large straightening jobs. Parts can be loaded on the work table with a hoist or fork truck—then the frame and workhead are centered over the job. The channels and workhead are easily raised or lowered if necessary to accommodate for work height.

DAKE Hydraulic Presses with movable frames are designed for hand, pneumatic, or electric operation. Capacities range from 25 to 300 tons. For detailed information, write for Bulletin 269.

In addition to conventional hand, air and electric hydraulic presses, Dake makes gap type, guided platen, and other special purpose presses.

**Dake Engine Company, 612 Seventh St., Grand Haven, Mich.**

**DAKE  
PRESSES**



Hand Operated Hydraulic



Power-Operated Hydraulic



Guided Platen



Gap Type Press



Flexible Frame



Flexible Frame

### Metal-Working News in Brief

**Wesson Metal Corp.**, Lexington, Ky., has announced the opening of a branch office located at 18353 W. McNichols Rd., Detroit, Mich. The new division will serve as the principal Wessonmetal outlet for fabricators throughout the state of Michigan.

— 0 —

**Barber-Colman Co.**, Rockford, Ill., has announced the appointment of **Robert A. Horner** as divisional man-

ager of the Machine and Small Tool Divisions. **Leo W. Reuland** has been promoted to sales manager of the Machine and Small Tool Divisions, succeeding Mr. Horner, and **Fred B. Jensen** succeeds Mr. Reuland as production manager of the Small Tool Division.

— 0 —

**Vanadium-Alloys Steel Co.**, Latrobe, Pa., has announced the addition of **Dr. John C. Hamaker, Jr.**, to its metallurgical department. Dr. Hamaker

was formerly plant metallurgist for General Iron Works Co., Division of Stearns - Rogers Mfg. Co., Denver.

— 0 —

**John F. Lampe**, formerly sales manager of M. B. I. Export & Import Company, has joined the machine tool division of Kurt Orban Co., Inc., New York, N. Y. Mr. Lampe will represent Kurt Orban in the eastern Pennsylvania and southern New Jersey areas.

— 0 —

**Firth Sterling, Inc.**, Pittsburgh 30, Pa., has announced that the address of its southern district office has been changed from 2308 Fourth Avenue North to 2201 Highland Ave., Birmingham 5, Alabama.

**ECONOMIZE with Morton**  
**... FIXTURE CLAMP and COMPONENTS**

**IMMEDIATE DELIVERY**  
**LARGEST ASSORTMENT OF SIZES AND TYPES IN THE INDUSTRY.**  
**ASSURED QUALITY and SERVICE.**

**WRITE TODAY**  
For our Catalog showing our complete line and including full size templates of each Fixture Clamp and Component... Save Tool and Designing Costs.

**MORTON MACHINE WORKS**  
2425 Wolcott St., Detroit 20, Mich.





## INDIVIDUAL VULCAINAIRE DUST COLLECTING UNITS

Are used on surface and other grinders where grinding dust must be removed.

Inexpensive, compact units, with no moving parts. Operated from your present air supply.

Installed in a few minutes, eliminating need for costly centrally located dust collecting systems.

The collector element is mounted on the side of the machine. Quickly cleaned, requiring no refills.

Vac-suction pick-up device (vacuum nozzle) is mounted on the grinding wheel guard or close to grinding wheel on other applications. This mounting permits constant contact with dust as the wheel is moved up or down.

A simple needle valve operates the unit, and can be shut off whenever the machine is not in use.

Available in 700 series for grinding wheels 7" dia. or less.

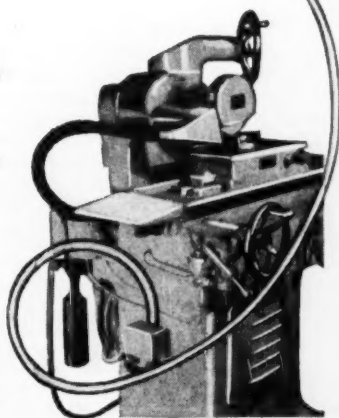
Made by the makers of Vulcanaire The jig grinding attachment.

Write on your letterhead  
for "Dust Collector" Booklet.

### VULCAN TOOL CO.

Pritz and Highland

Dayton 10, Ohio



## Metal-Working News in Brief

Grant S. Diamond, president of Electro Refractories & Abrasive Corp., Buffalo, N. Y., has been elected vice president of the Grinding Wheel Institute, Cleveland, Ohio. Mr. Diamond, former institute board member and former chairman of the public relations committee, will serve as vice president for the next two years.

Carboloy Department of General Electric Co., Detroit, Mich., has announced that **Frank Brossy**, formerly with MacManus, John & Adams, Inc., Bloomfield Hills, Mich., has joined its advertising and sales promotion section. **M. L. Smith** has rejoined Carboloy as a marketing trainee in the permanent magnet field after two years in the Marine Corps. The company has also announced the appointment of **Mahar**

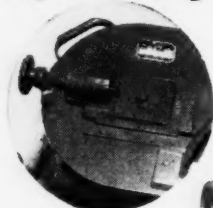
**Tool Supply Co., Inc.**, Saginaw, Mich., as an authorized distributor for its entire line of standard cemented carbide tools and blanks, carbide-tipped masonry drills, and diamond wheel dressers.

— o —

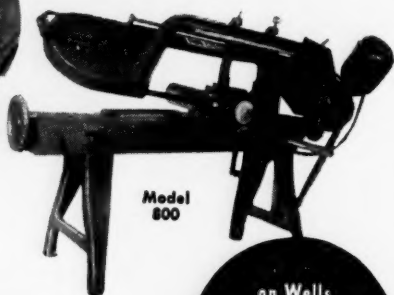
The Cleveland Crane & Engineering Co., Wickliffe, Ohio, has announced the opening of a new direct factory office in Detroit for the sale and service of Steelweld metal-forming presses and shears throughout the state of Michigan. Located at 2361 Penobscot Building, the office will be headed by **Ralph K. Ford** who was formerly associated with the Steelweld Machinery Division at the home office in Wickliffe, Ohio.

# NOW

## Wells offers you fool-proof blade tensioning ...



Above is a close-up of the new Wells blade tensioning device.



Model 800

NOW IT IS POSSIBLE to maintain a constant blade tension on Wells cut-off saws. You can replace or change the blade any number of times, yet quickly and easily duplicate the correct blade tension. The new device is standard equipment on the models listed above. Simply turn the tension hand wheel until the fixed and moving indices coincide. At this point the blade tension is correct regardless of variation in blade length.

on Wells  
No. 5, No. 8, No. 12  
and Model 800  
cut-off saws



*Products by Wells are Practical*

### METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION  
808 TYLER ST. - THREE RIVERS, MICH.

**Raise the feed . . .**  
**Cut your die costs with . . .**



**LARGEST SELLING  
CUTTERS FOR TOUGH DIE STEELS**

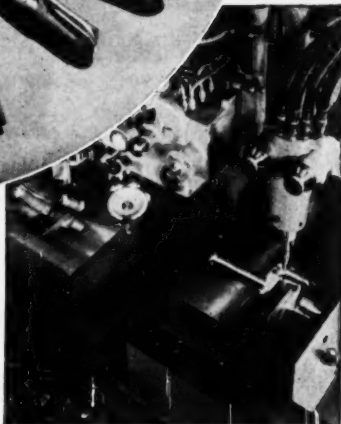
You get more work between grinds . . . with these *extra rugged* T-J Die Sinking Milling Cutters. That's why they're top favorites in die and forge shops everywhere! T-J Cutters are correctly designed for speed, accuracy and long life . . . hold a sharp edge longer . . . less breakage! Made from an extremely high grade steel . . . properly machined . . . scientifically heat-treated and accurately ground. Wide range of styles and sizes to *reduce your die costs!* Send for new catalog 4-153. The Tomkins-Johnson Co., Jackson, Mich.

**FOR TOUGH JOBS SPECIFY**



**TOMKINS-JOHNSON**

DIE SINKERS AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHERS



T-J Cutter at work on a Cincinnati 16" Vertical Hydrotel, latest design Die Sinker. A cutter of the right design and heat treatment for this high speed work in tough die steels, making possible the maximum efficiency of these new machines.

## Metal-Working News in Brief

**H. M. James**, president of Tubular Micrometer Co., St. James, Minn., manufacturer of "Tumico" precision hand tools and measuring instruments, has announced a new and improved service to its dealer organization, whereby factory trained personnel are being placed in various sections of the

United States to give increased assistance to the dealer and his service organization and acquaint them with the latest developments in the precision measuring and gaging field.

— o —

**M. E. Dorman** has been appointed manager of materials for the Canton Division of E. W. Bliss Company. In addition to supervising the Canton Division's purchasing department, Mr. Dorman will be in charge of inventories, stores, and receiving operations.

— o —

**Firth Sterling, Inc.**, Pittsburgh 30, Pa., has announced that **M. F. Judkins**, new products manager, will be in charge of the commercial sales of zirconium and zirconium alloys. **J. Mabon Childs** will be the project engineer for industrial sales of zirconium.

— o —

**Bill L. Gaines** has been appointed sales engineer for Wales - Strip-pit Corp., North Tonawanda, N. Y. Mr. Gaines will work out of the St. Louis division headquarters, covering most of Indiana, Illinois, Missouri, and Kansas.

**NATIONWIDE METALWORKING SERVICE ON . . .**

**OVER 800 DIFFERENT NELCO CARBIDE TIPPED TOOLS!**



**. . . to fill 90% of all special tool applications!**

Whether the job calls for special or standard cutters, check the Nelco distributor in your locality—a Nelco carbide tool to do the job, *as quickly and efficiently as any "special" that could be built*, is probably on his shelves. Every standard Nelco tool comes in a wide variety of sizes to assure you the cutter you want, when you want it—without delay, without "special tool" cost!

A Nelco field engineer will be glad to call —"troubleshooter" in your plant—on your machines—save you production hours, production dollars!

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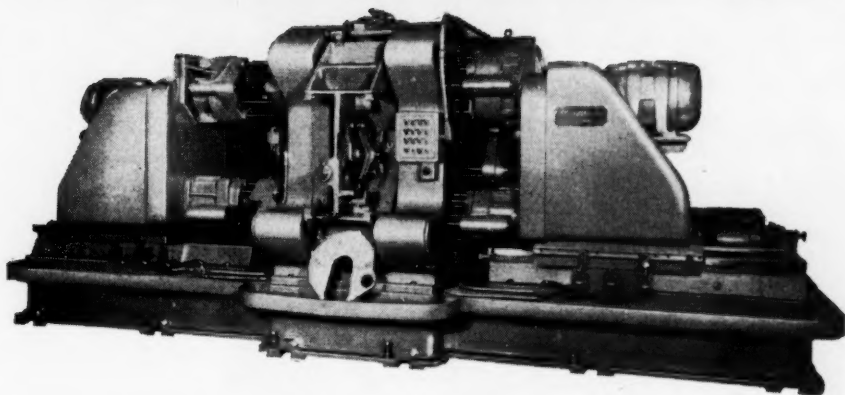
**NELCO TOOLS**

**NELCO TOOL COMPANY, INC., MANCHESTER, CONNECTICUT**

**For that Extra EDGE in Production**



# SPECIAL DOUBLE-END DRILLING, BORING and TAPPING MACHINE



Illustrated is one of the special machines we are constantly building, in addition to our line of MULTIPLE DRILL HEADS, to meet the specific requirements of plants, large and small. This machine is used for drilling, boring and tapping the adapter plate on an automatic transmission . . . The part is completely bored, drilled and tapped on this machine. We are using two of our Standard HH-20 Horizontal Way Type Units with an Automatic Index . . . The complete cycle is 30 seconds. The part is clamped with hydraulic cylinders.

*We solicit your inquiry as to any special drilling,  
milling or boring operations you may have.*



## ICHIGAN DRILL HEAD CO.

971 E. EIGHT-MILE ROAD

HAZEL PARK, MICH.

### Metal-Working News in Brief

Vanadium-Alloys Steel Co., Latrobe, Pa., has announced the election of **Dr. George A. Roberts** as vice president in charge of technology. Dr. Roberts was formerly chief metallurgist.

— o —

The appointment of **John A. Petrie** as a factory representative for its Truarc Division has been announced by **Waldes Kohinoor, Inc.**, Long Island City, N. Y. With headquarters

located at 716 S. Chesterfield Rd., Columbus, Ohio, Mr. Petrie will cover the Ohio, West Virginia, eastern Kentucky, and western Pennsylvania territories. **John C. Parry** succeeds Mr. Petrie as assistant to the Truarc sales manager, **Harold F. Bower**. The company has also announced that **Bearing Distributors**, Troy, N. Y., a Truarc distributor, has opened a branch office at 327 Fenn St., Pittsfield, Mass., headed by **Lewis K. Searly**, manager. **Precision Bearing & Transmission Co.**,

2851 Farnham St., Omaha, Nebr., has been named distributor for the Truarc line throughout Nebraska.

— o —

The Hendy Machine Co., Inc., Torrington, Conn., has announced the appointment of **M. J. Schmitt Machine Tools**, 8320 West Blue-mound Rd., Milwaukee, Wis., as its exclusive representative in Wisconsin.

— o —

Firth Sterling, Inc., Pittsburgh 30, Pa., has announced the election of **T. G. Barnes** as vice president of sales and **J. T. O'Brien** as vice president of operations. Mr. Barnes was formerly general manager of sales, and Mr. O'Brien was works manager.

Precision tapping costs less  
on your drill press with

*"Auto-tap"*

TRADE MARK

LEAD SCREW TAPPING  
ATTACHMENT

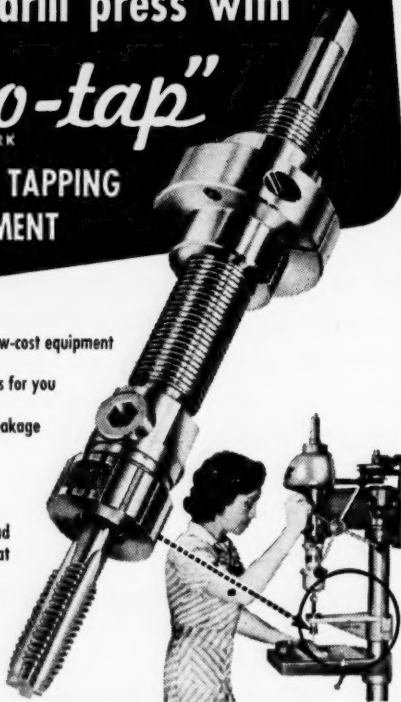
- Utilizes unskilled help and low-cost equipment
- Less scrap means more profits for you
- Longer tap life—less tap breakage
- Easily installed on column or gib drill presses
- Prices for interchangeable lead screw and support arm start at

\$59<sup>50</sup>

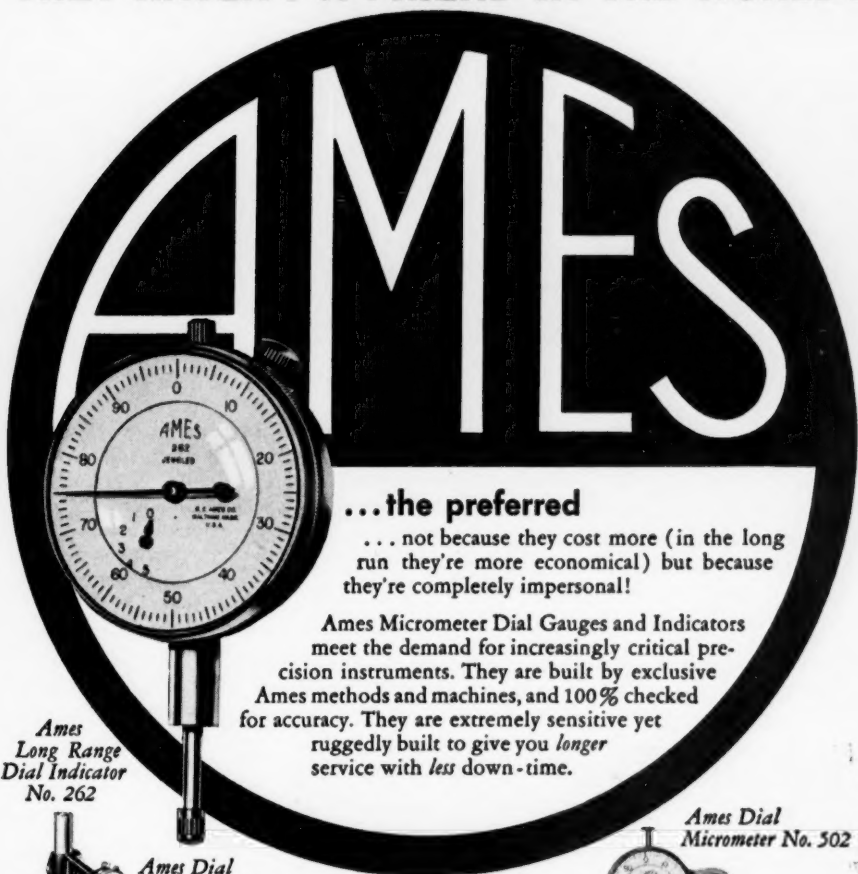
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*Automatic Methods*  
PRECISION PARTS FOR AIRCRAFT

957C West Grand St.  
Elizabeth, N. J.



# THEY HAVEN'T A FRIEND IN THE WORLD!

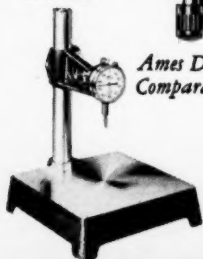


## ...the preferred

... not because they cost more (in the long run they're more economical) but because they're completely impersonal!

Ames Micrometer Dial Gauges and Indicators meet the demand for increasingly critical precision instruments. They are built by exclusive Ames methods and machines, and 100% checked for accuracy. They are extremely sensitive yet ruggedly built to give you longer service with less down-time.

*Ames  
Long Range  
Dial Indicator  
No. 262*



*Ames Dial  
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*Ames  
True Test Indicator Sets*



*Ames Caliper  
Gauge No. 12B*



*Ames Dial  
Micrometer No. 502*



*Send today for your  
free copy of Catalog No. 58*

*Representatives in  
principal cities.*

## B. C. AMES CO.

*29 Ames Street  
Waltham 54, Mass.*

**Mfr. of Micrometer Dial Gauges • Micrometer Dial Indicators**

## new shop equipment

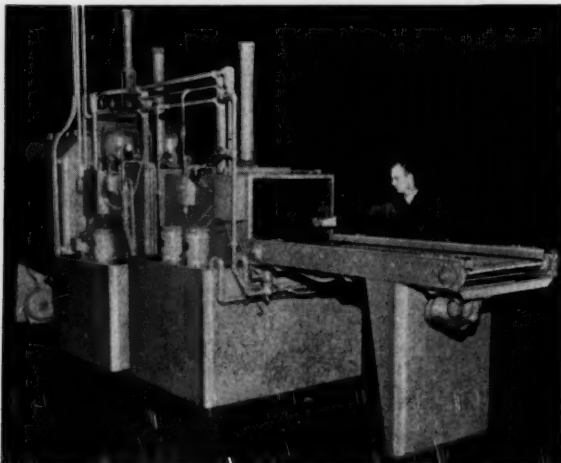
### Brine Quench Unit Features Automatic Cycling

A brine quench unit which is designed to speed quenching of heat-treated metals through automatic cycling has been announced by Ipsen Industries, Inc., 715 S. Main St., Rockford, Ill. Developed for use with Ipsen Series T Metal-Treating Furnaces, the self-contained unit features completely automatic transfer of work load from an adjoining heat-treating furnace through its own brine quench. Of welded steel design, the brine quench

unit is available in load capacities of 300, 400, and 700 pounds.

Solution temperatures, work handling, and solution circulation are all said to be controlled automatically by presettings on controls built into the regular furnace control panel. Temperature of the brine solution is controlled by immersion-type finned cooling coils through which tap water passes. A Partlow temperature control unit is said to assure proper, uniform temperature of the solution. The load-

er section of the unit also serves as a roller - type unloading platform.



### Engine and Tool- maker's Lathe

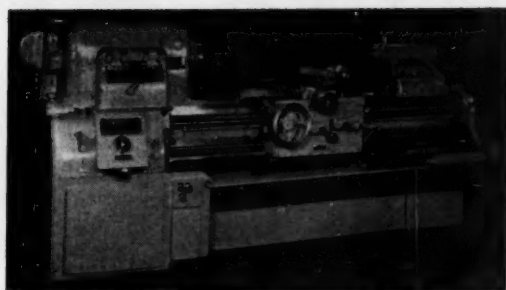
Identified as the Series 61, an engine and toolmaker's lathe which features built-in apron-controlled power rapid

▲  
Ipsen Automatic Brine Quench Unit being used in conjunction with Ipsen Automatic Controlled-Atmosphere Heat-Treating Unit

**Monarch Series 61 Engine and Tool-  
maker's Lathe**

traverse to the carriage and cross slide, providing rapid tool positioning, quick tool retraction, and fast carriage return, has been developed by The Monarch Machine Tool Co., Sidney, Ohio. The lathe has a longitudinal movement of 160 inches per minute and a cross movement of 75 inches per minute. A safety clutch is provided for all traverse movements which disengage automatically if they jam accidentally. Another feature of the machine is a direct-length reading dial, built into the apron, which facilitates multiple-diameter turning and blind-hole boring.

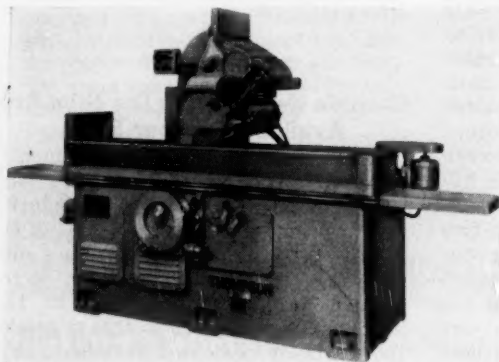
Other design and construction features of the Series 61 include totally-enclosed gearbox and end gearing; automatic pressure lubrication; anti-friction bearings; helical-gear head-stock utilizing ground or shaved gears; American standard Camlock spindle nose; flame-hardened and precision-ground integral bedways; and all critical parts made of hardened alloy steel. The lathe is available in 13, 16, and 20-inch sizes, as well as in numerous plus-swing sizes. Lead



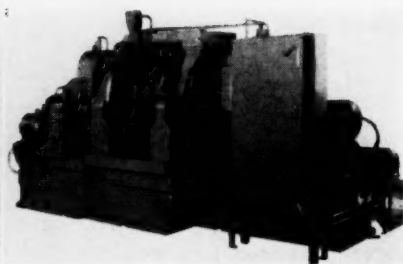
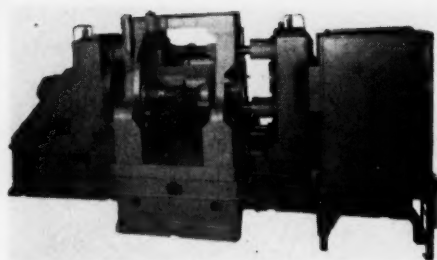
screw, feed rod, control rod, and traverse rod on longer bed units are continuously supported by traveling carriers and are automatically picked up or dropped off by apron movement.

**Hydraulic Surface Grinder Is  
Available in 16 Sizes**

Designated as the Type B, a hydraulic surface grinder which is available in 16 sizes ranging from 6 x 18 inches to 12 x 120 inches has been announced by The Thompson Grinder Co., Springfield, Ohio. Said to be ideal for fast, economical grinding of jig plates, intricate lamination dies, or jet engine parts, the grinder features a cross-feeding wheel head with horizontal spindle grinding with the periphery of the wheel; "in position" wheel truing; simplified controls and control panels; small increments of down feed and wide increments of cross-feed for quality finishes; flame-hardening cross slide ways; integral motor drive to the wheel spindle; and low pressure hydraulic system. Rigidly constructed, the machine incorporates an adjustable bronze spindle bearing and a manual cross-feed.



**Thompson Type B 12 x 24-Inch  
Hydraulic Surface Grinder**



(Left) Moline Model No. MR133 Special Two-Way Two-Unit Horizontal Hydraulic-Feed Machine.  
(Right) Moline Model No. MR132 Special Two-Way Three-Unit Horizontal Hydraulic-Feed Machine

Auxiliary equipment available for the Type B machine includes automatic down feed, micrometer backup stop, high speed spindle attachment, dust collector, auxiliary hand table feed, Høglund Magniform contour dressers, coolant filter, power elevation, magnetic chucks, demagnetizing switches, magnetic coolant separators, rectifiers and neutrolators, and wheel balancing ways and arbors.

### Special Machines for Rear Axle Housings

Moline Tool Co., Moline, Ill., has announced two special machines, designated as the Model No. MR133 and Model No. MR132, for rear axle housings. The Model No. MR133 is said to be capable of semi-finishing and finish boring right and left-hand rear axle housings for tractors. Two spindles mounted in large anti-friction bearings are located on each spindle unit. One spindle on each unit is used for the semi-finish operation and the other is for finish boring. Mounted between the boring units is a three-station hydraulically-indexed electrically-controlled trunnion-type fixture with two working stations and one loading station. After an axle housing is clamped in place at the loading station, the fixture is power indexed, bringing the part to the second or semi-finish bor-

ing station and then to the third or finish boring station. Next, the completed part is returned to the loading station and removed.

The Model No. MR132 drills, spot-faces, counterbores, taper reams, and taps tractor rear axle housings. A power-indexing trunnion-type fixture with one loading station and four working stations holds the workpiece. The machine is designed to accommodate two different types of housings of either right or left-hand design by providing additional spindles at various positions so that tools may be changed between spindles in order to handle either the left or right-hand part. The machine is arranged to have an automatic, electrically-controlled operating cycle, and a push-button station mounted on the side of the control enclosure serves to control the entire machine.

### Carbide Nail Gripper Die Nibs Are Available in Four Sizes

A standard line of unground cemented carbide nail gripper die nibs has been announced by Carboly Department of General Electric Co., 11143 E. 8 Mile Rd., Detroit 32, Mich. Four nib sizes are offered, ranging from  $\frac{1}{2}$  to  $\frac{3}{4}$  inch, designated as NDB-8, 10, 11, and 12. The nibs are available in grade 190 Carboly cemented carbide.



# SHELDON

CHICAGO

U. S. A.



## More will be *profit* with a SHELDON

It actually costs less to do most turning jobs on a Sheldon Precision Lathe. Machine-tool investment is cut to a fraction. Power cost is materially reduced. Less experienced operators can operate Sheldons safely and efficiently. Even cost-loadings for plant—floor space, heat and light are lower because two Sheldons can often operate in the space occupied by one large lathe.

On most "everyday" jobs a Sheldon will actually turn out more

pieces per hour too. With double V-belts to the spindle Sheldon lathes deliver enough power to take a healthy bite in direct drive, at really high speeds. Sheldon's "Zero Precision" Taper Roller Bearings permit work to the closest tolerances. Very seldom if ever are such extremely accurate bearings used in other lathes.

You will actually keep more as profit if you use Sheldon Lathes wherever possible.



Write for Catalog



**SHELDON MACHINE CO., Inc.** 4250 North Knox Ave., Chicago 41, Illinois

## Oven Relieves Hydrogen Embrittlement

Despatch Oven Co., Minneapolis 14, Minn., has announced an oven, identified as the RS-3 HD, which is designed for relieving hydrogen embrittlement. The effect of this type of oven is to restore physical properties to steel which have been removed during electroplating processes. Parts are usually baked from 1 to 5 hours at tempera-

# STAMPINGS

**ONE  
SUPPLIER**



**regardless of  
quantity—at  
minimum cost.**

*Send for literature.*

**STAMPINGS  
DIVISION**



3301 UNION STREET, GLENBROOK, CONN.



Illustration showing Despatch RS-3 HD Oven being used for relieving hydrogen embrittlement of various plated aircraft parts

tures ranging from 375 to 650 deg. F. Said to be highly adaptable to handling metal parts with complete temperature uniformity, the oven has removable shelves and a loading rack with J-hooks. The unit is gas or electric operated.

## Punch Press Feed Is Operated by Hydraulic Oil

Designated as "Hydrafeed," a punch press feed which is operated and con-



## Multiple Spindle Drill Heads

DURANT offers everything you need in top quality, high production multiple spindle drilling equipment with the broadest and most versatile line of standard models available, ranging from 2 to 20 spindles. All allow quick adjustment; eliminating high cost set ups. Models adjust as close as  $\frac{3}{16}$ " on centers. Custom built models made to your specifications. Write for free catalog.

## DURANT TOOL SUPPLY CO.

155 ORANGE STREET, PROVIDENCE 3, R. I.

# CUT...

## OPERATING — MAINTENANCE — SPOILAGE

# COSTS!

### ON YOUR TAPPING JOBS!

Proconier Tappers are the last word in economical, efficient, high speed tapping. More and more manufacturers are realizing that Proconier offers them the solution to their steadily rising production costs on many tapping operations. Only Proconier has the unique construction features that permit inexperienced operators to tap like experts. Proconier Tappers provide many extra hours of continuous, accurate tapping without frequent "down-time" interruptions. Proconier Tappers are producing more—with fewer rejections, fewer spoiled pieces and a minimum of broken taps. There are many reasons for Proconier's superiority in the tapping industry. Here are just a few of the many remarkable mechanical improvements that only Proconier provides: new sensitive double cone friction clutch; soft cushioned action driving pressure; ballbearing equipped; heat treated gears; special balanced gear reversing mechanism; smaller—lighter more accurate tru-grip tap holder; and many others.



#### NEW "TRU-GRIP" Tap Holder

The exclusive Proconier "Tru-Grip" tap holder is lighter, smaller in diameter. It affords easier tapping close to walls or shoulders, eliminates "chewed" tap shanks. Holds tap true.

#### Write for FREE Brochure

Giving full particulars on the complete line of Proconier Tapping Machines. Learn how you can adapt them to your specific needs.



# Proconier

*Safety Chuck Company*

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#### PROCONIER SAFETY CHUCK CO.

12 S. Clinton St., Chicago 6, Ill. Dept. 1

Gentlemen: Please send your illustrated brochure giving complete details, specifications and prices on the improved line of Proconier High Speed Tapping Heads.

Name .....

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City..... Zone... State.....

**YOU PROFIT on every  
job you send to Rutland!**



Rutland reworked or repaired cutting tools are guaranteed to give new tool performance — at a fraction of the new tool cost.

Recutting • repairing • replacing Carbide tips.  
Special tools from obsolete or standard tools, etc.

Call or Write

**Rutland TOOL SERVICE**

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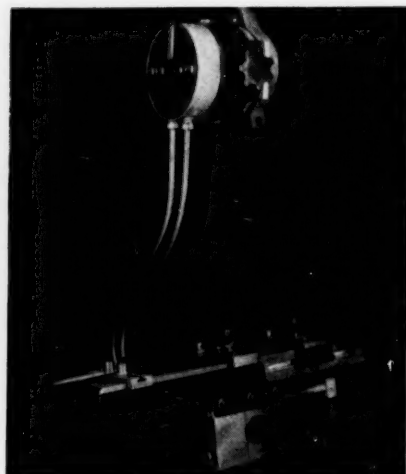
**MARK and DEMAGNETIZE  
IN  
ONE OPERATION**



The Luma combination etch tool and demagnetizer, etches, demagnetizes, anneals and solders. Permanently marks hardest steel with ease of a pencil. Write for complete information.

**Luma Electric Equipment Co.**  
P. O. BOX 132-MS TOLEDO 1, OHIO

trolled by hydraulic oil to directly couple the rotation of the crankshaft to the reciprocating feed table is now being marketed by Jaco Devices Inc., 98 High St., Hingham, Mass. The unit utilizes the principle of a positive displacement pump with a handwheel control for varying the volume of oil displaced, permitting immediate and infinite adjustment of desired feed length within the limits of the tool from zero to maximum movement. Provision is made to permit timing



"Hydrafeed" Punch Press Feed in use

stock movement to start or end at any point in the ram stroke, and adjustments are provided to raise or lower the feed table within a range of 4 inches to maintain the strip center line level with each press tool. The slide table is equipped with openside gripper boxes which are said to permit easy loading of either coil or strip materials.

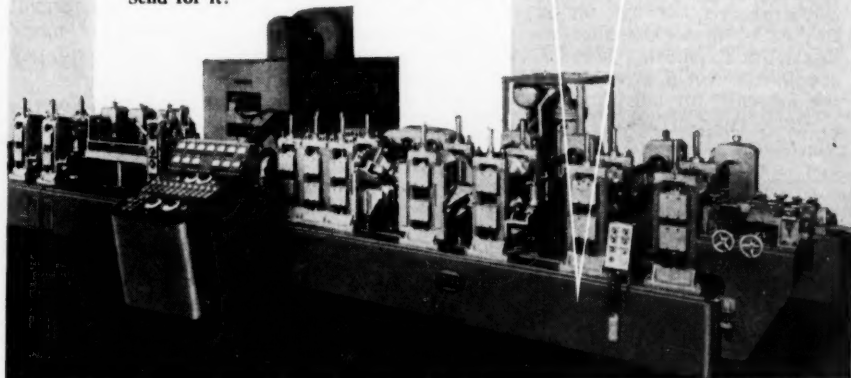
The feed unit is available in two sizes; namely, Models A and B. The Model A is designed to handle material up to 6 inches wide x 3/32 inch thick and has a 6-inch maximum feed

*Introducing...* **FIRST HIGH-SPEED,  
LOW-COST PROCESS  
OF COLD FORMING  
AND WELDING**

## NON-FERROUS TUBING

ALUMINUM • MAGNESIUM • NICKEL • BRASS AND OTHER ALLOYS

● Speeds range from 30 to 120 fpm, depending on gauge and kind of metal. The process makes possible the conversion into tubing of coiled strip in gauges from 0.156" all the way down to 0.025", *without drawing and annealing*. This means drastic reduction in the cost of making non-ferrous tubing. The lighter the gauge, the greater the saving. Thus, for the first time in tube making history, through an exclusive Yoder development, coiled non-ferrous strip can be converted into high grade tubing entirely by cold process, at speeds approximating those employed in making steel tubing by resistance-welding. Non-ferrous producers as well as fabricators using tubular components will be interested in the story of this epoch-making development. Send for it!



**THE YODER COMPANY • 5532 Walworth Ave., Cleveland 2, Ohio**

stroke. The Model B capacity is 12 inches wide x 3/32 inch thick and has a 12-inch maximum feed stroke.

### Pipe Wrench Features Double-Action Spring

Capewell Mfg. Co., Hartford, Conn., has announced the Armstrong-Bridgeport Pipe Wrench with double-action spring to ensure instant grip and release. On removal of the hook jaw, the



Armstrong-Bridgeport Pipe Wrench

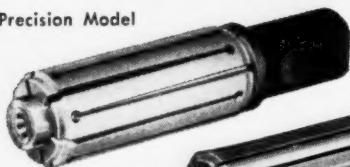
spring stays in the handle and will not fall out; however, it can be easily snapped out for cleaning or replacement if necessary. The hook and

heel jaws are made from a special analysis steel which has been triple heat treated to prevent crushing or chipping of the teeth. The teeth are machined to the correct shape and pitch to afford a positive grip and quick release. Hook jaw threads and knurls are designed with a deep thread to provide maximum strength yet permit easy operation, and the handle, with integral housing, is made of high - quality steel.

All parts of the wrench are said to be interchangeable with other wrenches of similar design with the exception of the spring. The wrench is available in nine sizes ranging from 6 to 48 inches in length.

## CHAMPION E-X-P-A-N-D-I-N-G MANDRELS

Precision Model



Standard Model



**give  
speed to  
every set-up**

The flexible sleeve, mounted on tapered arbor, expands automatically to fit the hole. Inserted by hand — no arbor press needed. Always an exact, positive, concentric fit. Locked by a single mallet blow. Unlocked the same way. CHAMPION Expanding Mandrels are used in machine shops around the world. Save time, cut production costs, whether the job calls for machining one piece or a thousand.

**Precision Model** has expansion range of .010". Available in regular sizes to fit holes from 1/2" to 3" diam. Holds work to tolerances of .0002" run-out. Guaranteed for precision grinding, turning and milling operations.

**Standard Model** maintains close tolerances, handles material of any length bore, hard or soft metals — from thin tubes and bushings to heavy castings and forgings. A set of fourteen will fit every hole from 1/2" to 9 1/2" diam.

CHAMPION Expanding Mandrels can be made in special shapes and sizes to fit any specifications. Quotations on request. Write for descriptive folder today.

**WESTERN TOOL & MFG. CO., INC.**

Dept. 28

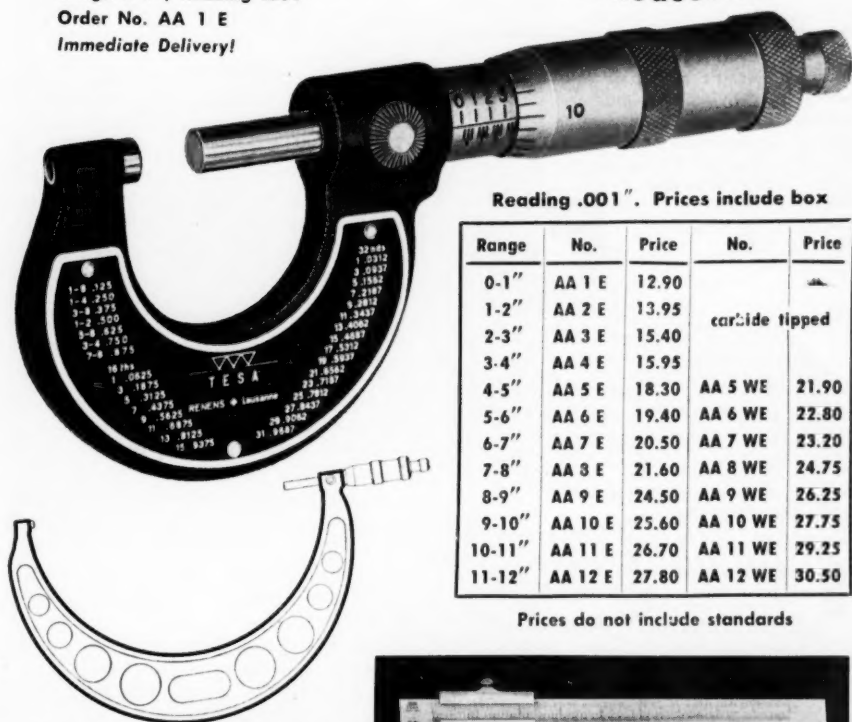
Springfield, Ohio



# A High Precision Micrometer FOR ONLY \$12.90

Range 0-1", Reading .001"  
Order No. AA 1 E  
Immediate Delivery!

Be more accurate! Buy  
  
**TESA**  
Precision Measuring Tools

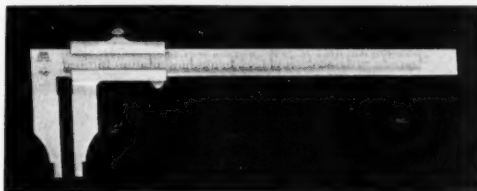


Reading .001". Prices include box

Range	No.	Price	No.	Price
0-1"	AA 1 E	12.90		
1-2"	AA 2 E	13.95		
2-3"	AA 3 E	15.40	carbide tipped	
3-4"	AA 4 E	15.95		
4-5"	AA 5 E	18.30	AA 5 WE	21.90
5-6"	AA 6 E	19.40	AA 6 WE	22.80
6-7"	AA 7 E	20.50	AA 7 WE	23.20
7-8"	AA 8 E	21.60	AA 8 WE	24.75
8-9"	AA 9 E	24.50	AA 9 WE	26.25
9-10"	AA 10 E	25.60	AA 10 WE	27.75
10-11"	AA 11 E	26.70	AA 11 WE	29.25
11-12"	AA 12 E	27.80	AA 12 WE	30.50

Prices do not include standards

A stainless steel vernier caliper of highest accuracy. Reading .001" and 1/64", Range 9" for only \$18.95 including form fitting leatherette case. Order No. CA25C.



**P.I.T. PRECISION INSTRUMENT  
& TOOL CORPORATION**  
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Circle 6-5694

Immediate delivery on these and other TESA Precision measuring tools. If your local distributor cannot supply you, write us for complete details and literature. Dealer inquiries invited.

## Live Pilot Bearing Bushing Is Available in 50 Standard Sizes

J. G. Jergens Co., 11106 Avon Ave., Cleveland, Ohio, has announced the availability of a live pilot bearing bushing in a range of over 50 standard sizes for various precision tool piloting applications requiring absolute seal of the bearing cavity from the abrasive action of grit and cool-



Jergens Pilot Bearing Bushing used in a precision piloting application on a heavy-duty boring mill operation

No. S.O. 3787—4-Way Hydraulic Drilling and Tapping Machine equipped with two 10-H.P. Way Type Drilling Units and two 2-H.P. Drill Units. It has a 4-Station trunnion type index fixture with hydraulic actuation. Units are electrically interlocked for control of cycle. PART: Motor End Hood. OPERATION: Drill and Tap all holes. PRODUCTION: 160 per hr.

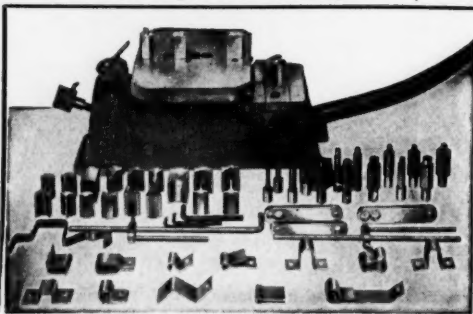


New Center Bldg., Detroit 2, Michigan

ants. According to the manufacturer, the live sealing action increases in effectiveness as dust, grit, and coolant enter into the outer seal. In each size of the bushing, tapered bearings can be adjusted to compensate for wear and are adaptable to receive removable slip bushings, keys, or keyways.

## Tap Holder Features Cylindrical Guide for Smooth Tapping

A non-releasing tap holder which features a cylindrical guide for smooth, exacting tapping operations has been announced by Barnaby Mfg. Co., 74 Knowlton St., Bridgeport, Conn. According to the manufacturer, the pull-out type holder, which is available in three sizes, will monitor the most severe tapping operations without sticking or jamming and can be used on turret lathes, as well as screw machines, for holding taps while



## Multiform

### BENDER CUTTER

Users report the Multiform Bender one of the handiest tools in the shop. No special tooling . . . Bends, Cuts, Punches, Flats, Rounds into Any Shape, Clamps, Brackets, Springs, Busbars, Wire Forms, Aircraft Work, Steel Rule Dies, Etc.

AIR OR HAND MODELS FOR UP TO 1/4" to 4" MATERIAL

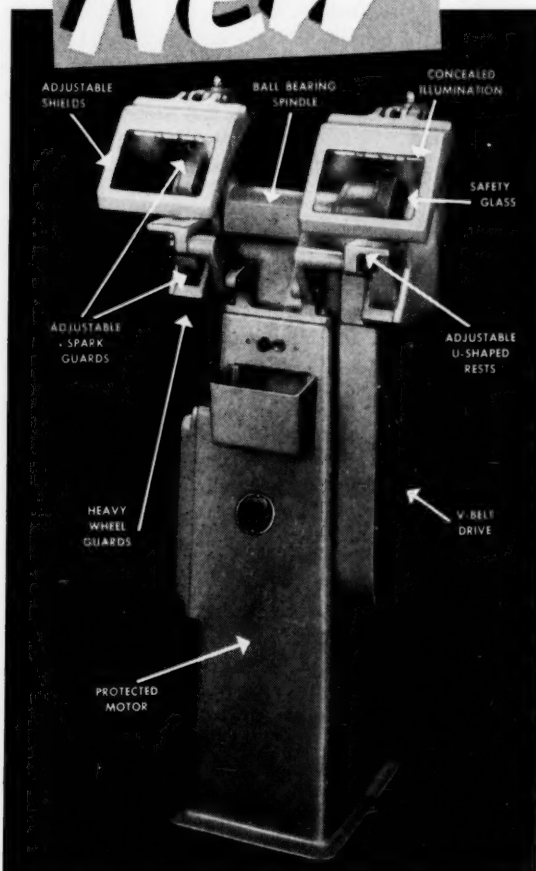
Write for brochure which illustrates and describes the four bender models.

J. A. RICHARDS CO.

Dept. 6-M Kalamazoo, Mich.

# New

## SOUTH BEND P E D E S T A L GRINDER



A ruggedly built grinder that will give long, dependable service under hard use. Ideal for rough or precision grinding. The motor is enclosed in the pedestal and drives through a V-belt. This removes the weight of the grinding wheels from the motor bearings and practically eliminates vibration. Moreover, it isolates the motor from abrasive dust and provides greater work clearance. Send coupon for complete information on this better-built grinder.

### SPECIFICATIONS

Wheel Size: 8" dia. (1/2 h.p. motor), 10" dia. (3/4 h.p. motor).  
Spindle: Approx. speed 2450 r.p.m. Sealed ball bearings.  
Motor: Standard 2875 r.p.m. 50 cycle or 3450 r.p.m. 60 cycle. Also D.C.  
Over-all Dimensions: 49 1/2" high, 18" wide, 20 1/2" deep (10" Grinder 1/2" wider).

8"—\$245.00; 10"—\$248.00 each less motor and remote control equipment. Terms are 10% down—balance in 12 months.  
F.O.B. Factory



Yes—you can get most any South Bend product immediately from our distributor's stocks in principal cities. Items not stocked, shipped promptly from factory.

Three ways to order:

1. See or telephone nearest distributor.
2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

### SEND INFORMATION CHECKED:

☐ 8" and 10" BENCH LATHES ☐ 10" to 16-24" FLOOR LATHES ☐ DRILL PRESSES ☐ TOOL GRINDERS ☐ 1/2" & 1" COLLET TURRET LATHES ☐ 7" BENCH SHAPERS

Name \_\_\_\_\_ Company \_\_\_\_\_

Street \_\_\_\_\_ City & State \_\_\_\_\_

Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana

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**UNIVERSAL**  
**DRILL BUSHINGS**

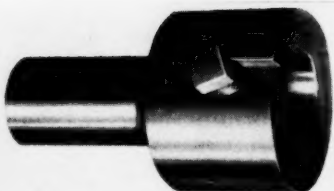


**BEAT ALL  
RECORDS  
FOR  
LONG  
LIFE  
AND  
ACCURACY**

**UNIVERSAL  
ENGINEERING  
COMPANY**

179-B

**FRANKENMUTH 9, MICHIGAN**



Barnaby Tap Holder

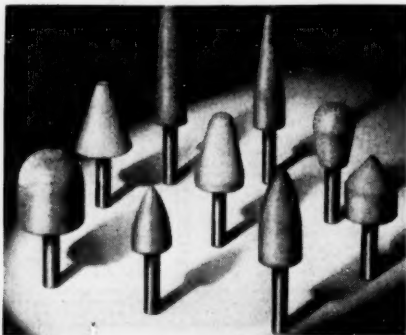
cutting internal threads. Designed to incorporate a small amount of float to correct any slight misalignment, the holder utilizes an extra-heavy set screw which, it is claimed, will withstand long, hard use without stripping. All parts are precision made and hardened for maximum service life.

The manufacturer states that long life is assured with a Du-Lite Black finish which reduces friction and prevents galling and scoring. The finish, it is claimed, will not chip, peel, crack, or blister. One Barnaby hinged-shoe bushing blank is furnished with each tap holder.

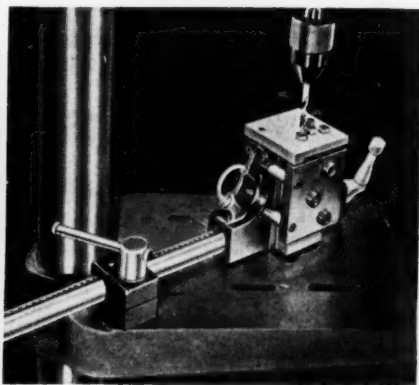
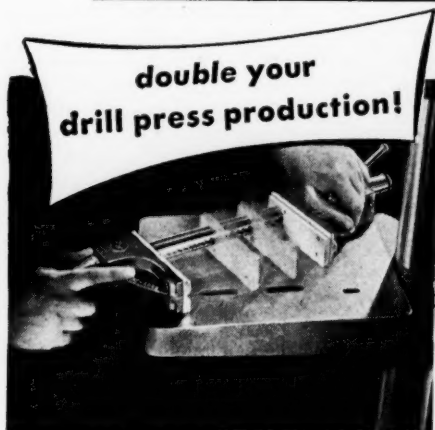
**Mounted Points Provide Soft,  
Cushion-Like Grinding Action**

Identified as "Nu-Tex," mounted points which are said to provide a soft, cushion-like grinding action that

"Nu-Tex" Mounted Points



# NEW AMF Float-Lock Instant-Change Safety Vise



IDEAL BASE FOR DRILL JIGS

Retaining its full-floating and locking features, but otherwise completely redesigned, the new AMF Float-Lock *Instant-Change* Safety Vise is faster, huskier, greater in capacity (9" and 12" jaw openings)... the most versatile, most economical work holder yet devised for drill presses!

New ratchet-locking jaw slides *instantly* to desired opening. The other, screw-operated jaw positively locks—or completely releases—work with a mere flick (about 1/4-turn) of the handle.

Vise turns over readily on three sides, permits extensive drilling without removing work. Horizontal and vertical "V" grooves align and grip rounds for end drilling, centering... ideal for angle drilling. Vise serves as low-cost drill jig when locked anywhere on the table... swings out of the way when not needed. Saves so much set-up time, compared with usual work-holding devices, that good operators should easily be able to double their production!



Contact your local AMF Float-Lock distributor for a demonstration. Or write for his name and address and a copy of new, descriptive Folder WF 53-1(a). Wahlstrom Float-Lock Sales Dept., American Machine & Foundry Company, 511 Fifth Ave., New York 17, N. Y.

MODELS ALSO AVAILABLE FOR BAND SAWS



cleans, polishes, and deburrs all types of metals and plastics in one operation has been announced by Atlantic Abrasive Corp., South Braintree 85, Mass. Designed for use on all types of precision instruments and machinery, the points are bonded together with a special resin. According to the manufacturer, the points produce an even, unusually smooth finished surface and will not clog or load even on soft metals. Nu-Tex Mounted Points are

available in all popular grit sizes and in grades ranging from 0 (hard) to 5 (soft).

### Single-Layer Diamond Wheel

Super-Cut Distributors Inc., 3418 N. Knox, Chicago 41, Ill., has announced a single-layer diamond wheel in which, it is claimed, all diamonds are accurately positioned with their protruding points in one plane. The wheel utilizes a hard nickel bond which is said to hold the diamond particles tightly. According to the manu-

facturer, the wheel can be easily indicated and trued to 0.0005 inch when installed by means of a device which provides for truing the wheel to the back plate by tensioning auxiliary screws at the low point of the wheel. The wheel is recommended for final micro-finish grinding only and fits practically all standard grinders.



Super-Cut Single-Layer Diamond Wheel

**For close tolerances...Machinists, tool and die makers insist on**

**INDIA & HARD ARKANSAS Oilstone Files**

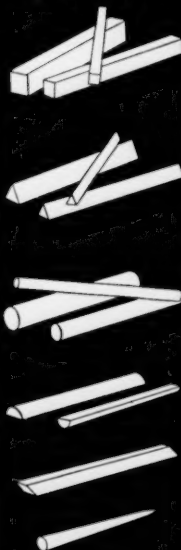
• For really close work on dies, tools, and parts, and for such jobs as deburring, radiusing, and chamfering, there is nothing finer than an INDIA or HARD ARKANSAS Oilstone File. Experts always have these famous files on hand. They cut fast and accurately to amazingly close tolerances. And there's a size and shape to fit any job. INDIA Oilstones come in three grits: Coarse, Medium and Fine. For the ultimate in superfine finishes, get HARD ARKANSAS Files. You'll have the finest available when you order these files from your distributor.

#### Get this helpful book

on the advantages of hand stoning cutting tools. Address Behr-Manning Corp., Troy, N. Y., Dept. MS-1.



35 shapes 97 sizes



▲COATED ABRASIVES  
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*a division of NORTON Company*



in air turbine grinders

**YOUR BEST BUY IS BUCKEYE**

**FAST—**

55,000 RPM

**POWERFUL—**

Full ¼ HP

**LIGHTWEIGHT—**

Just 1¾ Lbs.



here's a brand new  
air turbine grinder  
especially for  
carbide cutting!



More power per pound! That's the reason the NEW Buckeye Air Turbine Grinder will cut through grinding jobs faster, with less effort for the tool operator. Versatile—designed for use with tungsten carbide burrs, adaptable to use with rotary files and midget mills, may be mounted on tool post, takes mounted points up to ¼" shank.

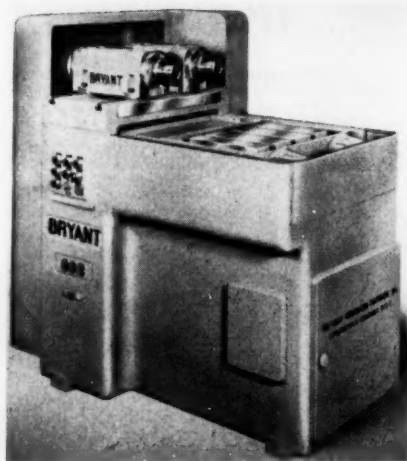
Write NOW for complete information on this NEW addition to the Buckeye Tools line of 56 portable air-powered grinders.

**Buckeye Tools**  
CORPORATION  
DIVISION 17 • DAYTON 1, OHIO

producers of  
the world's first  
successful  
rotary air tools

## Boring Machine Is Designed for Consistent Accuracy

Designated as the Model 998, a boring machine which is designed to provide consistent accuracy in precision boring, drilling, straight or contour turning and boring, facing, and grooving operations has been announced by Bryant Chucking Grinder Co., Springfield, Vt. According to the manufacturer, once the cycle is set up, it is positive and constant. The bed, bridge,



Bryant Model 998 Boring Machine

heads, and table of the machine are constructed of Meehanite castings. The table moves on preloaded ball slides and is mechanically actuated.

Cams and change gears are easily accessible for changing either the length of the stroke or the rate of travel. The motors for driving the cams and the boring heads are mounted in an accessible recess inside the bed, thus keeping floor space to a minimum. An ample fixture mounting surface is provided on the table which measures  $17\frac{1}{2} \times 22$  inches. The table has three  $\frac{1}{2}$ -inch T-slots and can accommodate a wide variety of fixtures.




**CONTINUOUS HINGES**

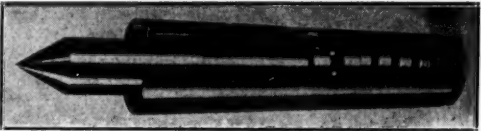
*Manufactured by*  
**AUTO MOULDING  
 & MFG. CO.**

**WRITE FOR STOCK LIST**  
**1114 E. 87TH ST. CHICAGO 19**

**"NIROL" NEEDLE BEARING SPRING LOADED LIVE CENTER**

**"NIROL"**

Trade Mark Reg. U. S. Pat. Off.



**NIROL MFG. CO.**

901 ROUTE 22 • NORTH PLAINFIELD, N. J.

- **ACCURATE**
- **COMPACT**
- **DEPENDABLE**

The most compact and rugged live center for its size. Minimum overhang adds to rigidity and machine capacity. Complete range of sizes.

*Write for Complete Information.*

## Power-Operated Vise Utilizes Conventional Vise Screw and Handle

Wilton Tool Mfg. Co., 925-941 Wrightwood Ave., Chicago 14, Ill., has announced the development of a power-operated vise, designated as the "WiltOmatic," which utilizes the conventional vise screw and handle for presetting the jaw opening to the size of the workpiece. The power unit, which is attached to a conventional Wilton vise, has an adjustable power

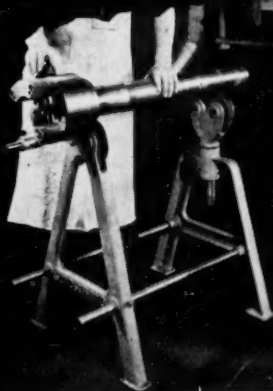


"WiltOmatic" Power-Operated Vise in use

stroke from 0 to  $\frac{3}{4}$  inch. Maximum jaw opening varies from 3 to 9 inches, depending on the size of the vise. The power stroke is activated by either a foot or hand control.

Relatively low air pressure from plant outlets can be used to actuate an air-hydraulic convertor which, in turn, is said to provide the vise with a powerful locking force at the touch of a finger. The vise is offered in sizes from 2½ through 6 inches, and conversion kits for converting manually-operated Wilton vises into WiltOmatics are available.

## Balancing Tools for a Wide Range of Work



Here's a complete line of Balancing Tools which will save their cost quickly on balancing or truing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts, fly wheels, pulleys, etc. The standard sizes available are shown in capacity chart below.

### CAPACITIES

Swing	Between Standards	Weight Capacity
21 in.	20 in.	12 lbs.
21 in.	20 in.	800 lbs.
43 in.	29 in.	800 lbs.
43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
8 ft.	8 ft.	10,000 lbs.
Any	Any	24,000 lbs.
43 in.	30 in.	800 lbs.

### FREE DATA



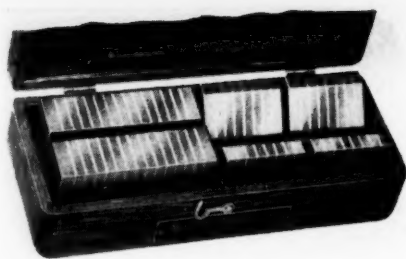
You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin 540.



**SUNDSTRAND MACHINE TOOL CO.**  
2539 Eleventh Street, Rockford, Ill., U.S.A.

## Magnetic Parallels and V-Blocks for Use on Magnetic Chucks

George Scherr Co., Inc., 200-MM Lafayette St., New York 12, N. Y., has announced a complete line of magnetic parallels and V-blocks, marketed under the trade name "Magne-Blox," which is designed for use on magnetic chucks to hold work for surface grinding operations. The parallels and V-blocks are made of alternate laminations of brass measuring 1/16-inch



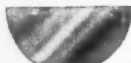
Scherr Universal "Magne-Blox" Set



MARK OF QUALITY

## STANDARD WOODRUFF KEYS

We manufacture a complete line of Woodruff keys in all standard sizes. These sizes range from as small as 1/2" x 1/16" to keys as large as 3 1/2" x 3/4". All keys are carefully checked for burrs, slivers, etc., before being shipped to you. Only the finished tested keys are permitted to leave our plants.



We carry a complete stock of high quality, dependable keys. Send for our catalog for complete information on Woodruff keys, taper pins, machine keys, and machine racks.

### STANDARD STEEL SPECIALTY CO.

BEAVER FALLS • PENNSYLVANIA  
Plants: Beaver Falls, Pa.; Hammond, Ind.

thick and selected iron laminations of high magnetic capacity measuring 3/16-inch thick. According to the manufacturer, these dimensions were selected so that the units can be used on all types of magnetic chucks, including the permanent magnetic types.

The parallels and V-blocks are available in standard sizes, shapes, and forms, as well as in sets. The Universal Magne-Blox Set consists of two parallels measuring 1x1 1/4x3 3/4 inches and two V-blocks measuring 1 1/4x2 3/8x1 7/8 inches and is supplied in a wooden case. Special sizes made to user specifications can be supplied.

## Unit Feeds All Types of Automatic Machines

Identified as the "Koil-Kradle," a device for automatically feeding all types of coiled stock to production machines has been introduced by



IN 11 SIZES—No. 6 to 1"  
N.C. In all S.A.E. sizes.

*You Need an Extra Hand Now  
to Speed Up Production!*

### HEIMANN TRANSFER SCREW SETS

Here is the faster, more precise way of transferring open and blind screw holes—make savings in "wage-dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combination holder and wrench—no other tools needed. Get more work now—save money too!

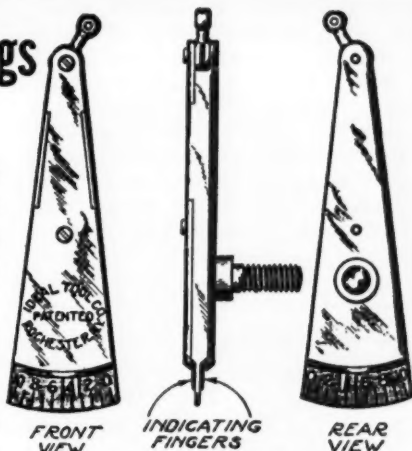
HEIMANN MFG. CO. • URBANA, OHIO

## DIAL Indicator Readings

### From Front or Rear

- Accurate readings from the front or rear of an IDEAL INDICATOR is especially helpful when locating holes or where the indicator is fastened to a revolving spindle.

- IDEAL INDICATORS have been serving industry for 40 years with complete satisfaction. Prices shown include holder. Why pay more for superior service?



Price . . . \$6.00

Write for complete details.

**IDEAL TOOL CO., 407 RIVER ST., ROCHESTER 12, N. Y.**

## "APEX" AXLE FINISHING TOOLS FOR "SELLERS" LATHES



**For Economy, Increased Production, and Accurate Regrinding of Angles with Fixtures**

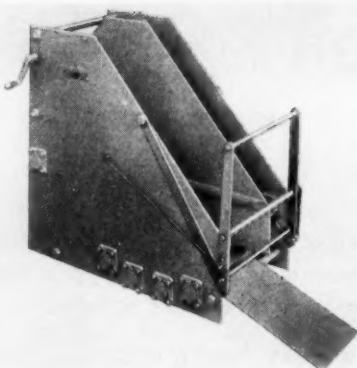
Standard holders with inserted carbide-tipped tool bits reduce your costs and give improved working conditions.

All tool bits are furnished finished ground with chip breakers and are ready for immediate use. Tool bits are adjustable in two directions to compensate for wear.

Full details mailed upon request.

**The Apex Tool & Cutter Co., Inc.**  
Shelton 15, Conn.

Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif. The unit features an automatic trip bar which actuates a motor switch as the slack loop is tightened. The motor then feeds a new loop at the rate of 90 feet per minute, automatically shutting off when the correct loop size is reached. Rate of feed to the machine is said to be universal and is determined by the machine's individual re-



Benchmaster "Koil-Kradle" Feed Unit

**ACROMARK**

Series 9A—  
Power Driven

## POWER MARKING MACHINES



are the last word for high production, high precision marking. A powerful gear reduction motor does the driving. Clutch operated. Fast, smooth and quiet.

Model 9 AMP—Motor Driven, Pedestal Model Shown.  
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**ACROMARK**  
Company

9 MORRELL ST., ELIZABETH 4, N. J.  
"THE ORIGINAL MARKING SPECIALISTS"

quirements. To ease loading, the trip bar lifts up, completely exposing the throat of the unit. A ramp is provided by which heavy coils can be rolled into the cradle.

Four driving rolls are mounted in cast iron pillow blocks, each equipped with needle-type roller bearings. All driving rolls are linked by roller chain and drive sprockets. An adjustable guide plate partitions the roll area, establishing the correct width for various roll sizes. Three unit sizes are available for 10, 13, and 15-inch roll widths, respectively, with 36-inch diameters. According to the manufacturer, the unit can be used with punch presses, slitters, forming rolls, shears, and various other machines.

## MILWAUKEE PRECISION EQUIPMENT

Surface Plates, Angles, Parallels, and Straight Edges are all backed by over forty years of practical experience. You pay no more for this added assurance of accuracy and durability.

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## **"57,000 Investors in Democracy"**



**HENRY FORD II**  
*President, Ford Motor Company*

***"In the most practical way possible—the regular purchase of U.S. Savings Bonds—millions of Americans are demonstrating complete confidence in our form of government. Investors in democracy, they are freely staking their personal security on a fundamental faith in the future of our nation. I am proud that today more than 57,000 Ford Motor Company employees are participating in the Payroll Savings Plan. Last year they bought Savings Bonds worth \$25,000,000 at face value, and this year the total of their purchases will be even greater. Through their thrift they are helping to keep America strong."***

Few investment groups are as important to America as the members of the Ford Payroll Savings Plan. They are *important* in size—57,000 men and women . . . important in buying power—they actually purchase \$25,000,000 in Savings Bonds every year . . . and *very* important to our economic stability—"through their thrift they are helping to keep America strong."

"Oh," someone may say, "it's easy for Ford to get thousands of people to sign up for the Payroll Savings Plan."

It was relatively easy for Ford, and it is easy for any company to build a

good Payroll Savings Plan if—(1) The head of the company recognizes the importance of the Payroll Savings Plan; (2) If he will show the same personal interest that Mr. Ford takes in Payroll Savings.

The Savings Bond Division, U.S. Treasury Department, Washington, D. C., is ready to provide all the help you need in the way of Application Blanks, literature, and a complete outline of a simple, person-to-person canvass that will put an application blank in the hands of *every* one of your employees. Your employees will do the rest.

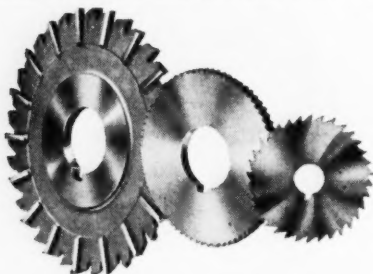
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**MODERN MACHINE SHOP**

## Metal Saws Feature Long Life

A line of metal slitting saws, screw slotting saws, small circular saws and



Summit Metal Cutting Saws

side chip and staggered tooth saws is now being marketed under the trade name Summit by L. H. Chappel & Co., 1137 Post Rd., Fairfield, Conn. Ac-

cording to the manufacturer, the saws are made of high tungsten steel for maximum production at high speeds, as well as for long life.

## Helical Carbide End Mill

Sonnet Tool & Mfg. Co., 576 N. Prairie Ave., Hawthorne, Calif., has announced a helical carbide end mill, designated as "Helicarb," which is designed for fast cutting speeds and which is said to produce finishes of 20 r.m.s. The end mill cuts with a shearing action and provides for uniform distribution of the chip load, resulting in minimum chatter and crumbling under impact. According to the manufacturer, the rake angle is constant throughout the entire face of the tooth, and the clearance angle is also constant, causing the included cutting

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DEEP THROAT PRESS



HORN PRESS



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**ROUSSELLE**  
PRESSES



These jobs will stand up under severe service—and they're fast . . . accurate . . . steady. Modern precision machining (stressing ruggedness and simplicity) has seen to that. But it also accounts for their very low maintenance, surprisingly low cost and broad, all-around versatility. With Rousselle presses you can shear, punch, bend and form metals; cut and punch paper; form and trim fibre and plastics and handle other materials.

Since considerable savings are often possible, if you let our engineering staff assist you, we will be glad to cooperate. There is no obligation. Simply explain problem and send sample or drawing of work.

Rousselle Presses are sold exclusively through leading Machinery Dealers and are Manufactured by

**SERVICE MACHINE CO.**  
7627-33 S. Ashland Ave., Chicago 20, Ill.

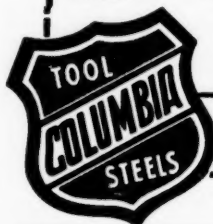
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all tools for all purposes

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**HOT WORK-  
SHOCK RESISTING:**

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Buster C.E.C.



**COLUMBIA TOOL  
STEEL COMPANY**

Main Office & Works  
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# REID

**TOOL ROOM ACCESSORIES**

## CONTROL BALL HANDLES



Round Plastic



Oval Plastic



Round Steel



Mushroom Plastic

The REID Line also includes c.i. hand knobs, hand wheels, machine handles, compression springs and scores of other needed tool room items.

**FREE  
NEW 48-Pg.  
CAT.**

**REID TOOL SUPPLY CO.**

Muskegon Heights, Michigan

# FLEXIBILITY

**FOR A WIDE RANGE OF JOBS**

**THE  
JOHNSON 706  
HARDENING,  
TEMPERING and  
ANNEALING  
FURNACE**



Select any temperature you require from 300° to 1875° F. Get clean, uniform heat at low cost. The Johnson 706 is easily regulated. Six direct jet bunsen burners have separate valves and pilot lights. Firebox 7 x 13 x 16½ lined with high temperature refractory. Counterbalanced door opens upwards.

No. 706 Pedestal  
(illustrated) ----- **\$300.00**

No. 706 Bench ----- **\$275.00**

No. 654 with 5 x 7¾ x 13½  
firebox:

Pedestal ----- **\$163.00**

Bench ----- **\$138.00**

**All Prices F.O.B. Factory. Order Now!**

**JOHNSON GAS APPLIANCE CO.**  
571 E AVE. N.W., CEDAR RAPIDS, IA.

**JOHNSON  
FURNACES FOR INDUSTRY**

**KIPP**  
*Air Grinders*



- **FASTER SPEEDS**
- **BETTER RESULTS**
- **LOW PRICES**

**MODEL JA**  
**50,000 R.P.M.**  
Weight 12 ounces; length 6¾ inches; chuck size ⅛ inch. Wheel guard removed for better illustration.

**\$42**  
IN U.S.A.

### THEY GRIND—NOT JUST RUB!

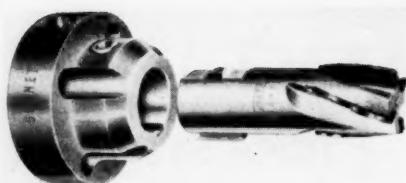
The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind... not just rub. Every mechanic knows this, but an inexperienced buyer may order tools that maintain proper grinding speeds only when running idle. The speed of Kipp air grinders drops but slightly when put to work. That means better work... longer wheel life.

### MADISON-KIPP CORP.

208 Waubesa St., Madison, Wis., U.S.A.

Write for KIPP Air Tool Catalog at 3006



Sonnet "Helicarb" Helical Carbide End Mill and Adapter

angle to also be equal for the entire cutting tooth.

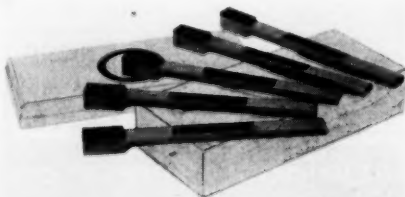
The Helicarb End Mill is available in six standard heavy-duty sizes ranging in diameter from 1½ to 4 inches for steel and non-ferrous cutting. A key-drive nose-type adapter for use with the end mill to provide a positive driving action can be supplied.

### Hand Hone Is Tipped with Diamond Concentrate

United States Diamond Wheel Co., 835 Illinois Ave., Aurora, Ill., has announced a hand hone which is tipped with diamond concentrate and which features a hollowed-out finger rest near the end for accurate operation. According to the manufacturer, the hone is applicable to all general and special shop requirements and provides a complete range for all tool and cutter dressing.

Available in single or double-end styles and in all required diamond grit sizes, the hone is packaged in a set of five in a clear plastic box, each with a different diamond grit size.

U. S. Diamond Hone Set





**Specify**

**DESTACO**

**FEELER STOCK**

For precision fitting, checking clearances, inspection and production work. Available in 12" strips, 1/2" wide, in cellophane, packed 12 pieces of one thickness to a box, also in 25-foot coils, 14 standard thicknesses from .0015" to .015".

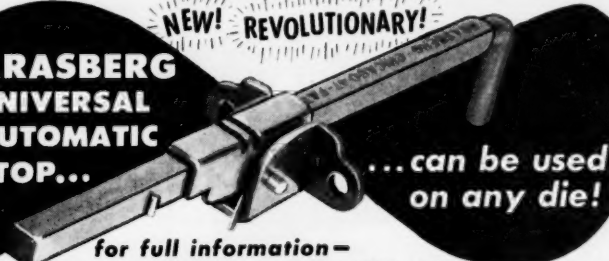


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UNIVERSAL  
AUTOMATIC  
STOP...**

**NEW! REVOLUTIONARY!**



**...can be used  
on any die!**

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**INSTALLED  
IN  
MINUTES!**

SIMPLY MOUNT TO  
FRONT OF STRIPPER  
WITH TWO SCREWS —  
THEN DRILL HOLE  
FOR ARM AT  
GAGING POSITION.

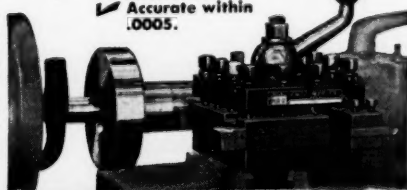
**Enco**  
**TURRET TOOL POSTS**  
**SAVE VALUABLE SETUP TIME**

The three photos at right illustrate the flexibility of 12-position indexing, whereby each tool may be used in three different working positions.

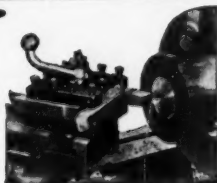
- ✓ Keep setting accurately.
- ✓ Indexing is self-contained — eliminates all chip-interference.
- ✓ Accurate within .0005.
- ✓ 12-position indexing.
- ✓ Hardened steel construction.
- ✓ Mounts rigidly in compound T-slot.

Send for Latest Catalog.

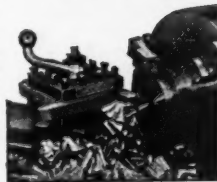
Manufacturers of the most complete line of Hexturret, Bed Turrets, Turret Tool Posts and Tail Stock Turrets in the Country. Send for Catalog No. 53.



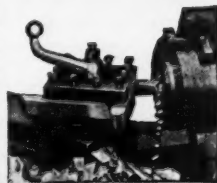
3/4" square tool bit mounted in Model 4 1/2-S turret used for facing cut.



Same tool used for broadface turning merely by indexing turret one position or 30°.



Same tool used for inside chamfer merely by indexing back two positions or 60°.



**ENCO Manufacturing Co., Dept. 114**

4524 W. FULLERTON AVE., CHICAGO 39, ILL.

Reasonable Deliveries

## Punching Machine Delivers Variable Impacts up to 3,500 Lb.

Black & Webster, Inc., Dept. N80, 445 Watertown St., Newton 58, Mass., has introduced a completely redesigned Electropunch, identified as the Series 4, which is said to deliver variable impacts up to 3,500 lb. at rates of more than 125 blows per minute. The entire solenoid on the punch is enclosed in a perforated steel housing for additional

protection, the cover of which can be easily removed to disassemble the solenoid, plunger, and return spring. An adjustable, cushioned return stop on top of the solenoid is designed to limit the return stroke and to reduce noise and wear. According to the manufacturer, the unit can be operated by hand, foot, or automatic switch and is particularly suitable where speed and high production rates are required, such as in staking riveting, marking and cutting.

The Series 4 Electropunch is a bench model unit weighing 50 lb. and can be plugged into any elec-

## Free! BARNES HANDBOOK on HACK SAWING and BAND SAWING



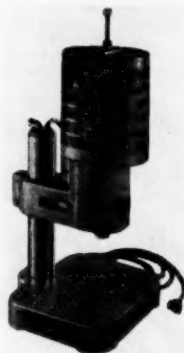
Profusely illustrated with photos, charts and diagrams and loaded with technical data and explanatory sketches, Barnes Handbook of Metal Sawing is a must in every shop using Hand or Power Hack Saws and Band Saws.

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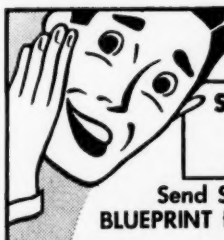
**W. O. BARNES CO., INC.**  
DETROIT 14, MICHIGAN



Black & Webster Series 4 Electropunch

trical outlet. Adjustment tools are included with the unit and are conveniently retained in the column when not in use. Standard Electropunch accessories, such as the impact control,





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**ATLANTIC GEAR WORKS, Inc.**

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## **BURR Midget Portable KEYSEATERS**

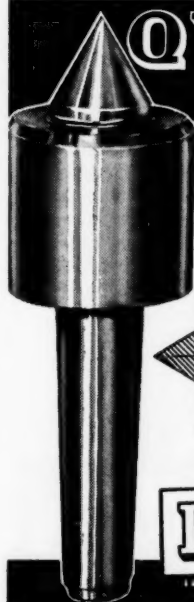
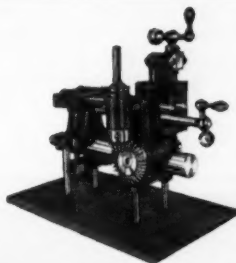
Hand, Drill or Motor drive to handle shafts up to 2½" for cutting Woodruff and Straight keyways. Light weight for field work. Other series up to 12" shaft capacity.

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**JOHN T. BURR & SON, INC.**

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BROOKLYN 11, NEW YORK

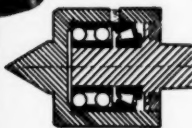


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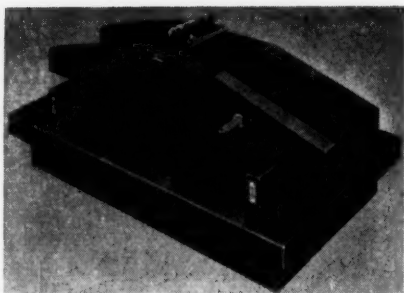
**TOOL & MACHINE CO., INC.**  
496 Broadway, Brooklyn 11, N. Y.

**"TWO DECADES OF IMPORTANT TOOL PARTS PRODUCTION"**

single stroke control, automatic repeating control, safety switch, and foot switch, can be used with the Series 4 model.

### Black Granite Parallel Straightedges in Matched Pairs

Parallel straightedges made of diabase (black granite) in matched pairs have been announced by Rahn Granite Surface Plate Co., 636 N. Western Ave., Dayton 7, Ohio. The accompanying illustration shows a pair of straightedges 36 inches long and 6 inches high. The 22-inch long top edges have been finished parallel to the 36-inch edges, and both pieces are the same height within a tolerance of 0.00005 inch. The 36-inch edges are



Rahn Black Granite Parallel Straightedges placed across a pair of black granite parallels

also said to be straight within 0.00005 inch. According to the manufacturer, all internal stresses have been removed so that the edges will never become distorted.

**Dull tools cost you money!**

A black and white illustration of a male worker in a cap and uniform operating a large industrial machine, possibly a surface grinder. The machine has a large wheel and a complex frame. The text 'Dull tools cost you money!' is written in a large, stylized font on the left side of the illustration.

### GRAND RAPIDS GRINDERS

GALLMEYER & LIVINGSTON CO.  
308 Straight Ave., Grand Rapids, Mich.

MANUFACTURERS OF SURFACE GRINDERS, CUTTER  
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Table movement: 6" x 10"; table size, 7" x 17½".

Send TODAY for complete information.



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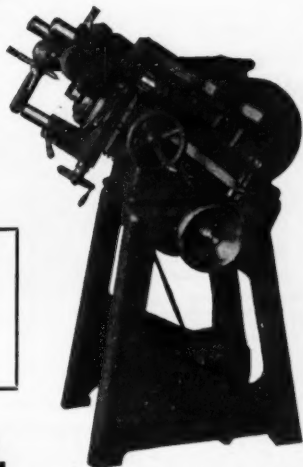
661 STATE ST. EXT., BRIDGEPORT 1, CONN.

## Punches Shaped from the SOLID with OTTMANN Punch Shaper



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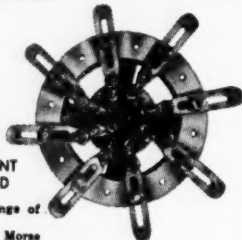
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DO IT FASTER



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#0—0" to 1/4" Tap Capacity  
4 Spindles.  
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4 Spindles.



UNIVERSAL JOINT  
DRILLING HEAD

#0—0 to 1/4" Full range of  
collets furnished.  
#1—3/16 to 1/2"—#21 Morse  
Taper socket or chucks  
for straight shank drills.

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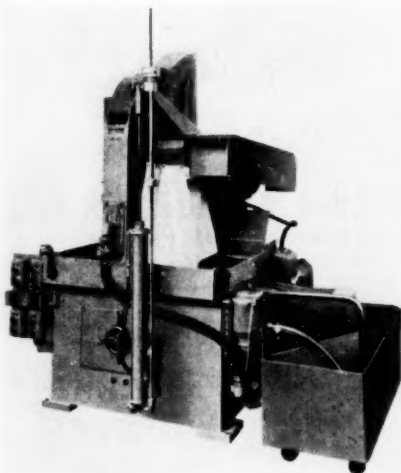
These dependable tools are adjustable to any pattern of holes . . . are available with 4 to 12 spindles. Heads made of the best grade sand Cast Aluminum with hardened and ground gears and spindles (made in one piece). Full grooved ball thrust bearings at all thrust points and Oilite bronze radial bearings.

Write For Complete Literature

**ERRINGTON Mechanical Laboratory, Inc.**  
Established 1891  
Main Office and Plant, STATEN ISLAND 4, NEW YORK

## Wet Abrasive Cutting Machine Cuts 8-Inch Solids

Designated as the Model 480, a wet abrasive cutting machine which is said to be capable of cutting 8-inch solids with a minimum burr has been announced by Campbell Machine Division, American Chain & Cable Co., Inc., 931 Connecticut Ave., Bridgeport 2, Conn. Designed to cut boiler tubes, bar stock, and so on, either ferrous or non-ferrous material, including corrosion-resisting steel and hardened or



Campbell Model 480 Wet Abrasive Cutting  
Machine

annealed steel, the Model 480 is an oscillating type machine, and the wheel feed and work clamps are hydraulically operated. The work bar is hand fed, and the temperature of the workpiece is controlled by the proper distribution of coolant.

The machine utilizes a 25-h.p. 1,800-r.p.m. main motor for the abrasive wheel, a 1-h.p. geared-head 56-r.p.m. oscillating motor, a 1/2-h.p. 1,200-r.p.m. hydraulic system motor, and a 1/4-h.p. 1,800-r.p.m. built-in type coolant pump motor. The machine accommodates



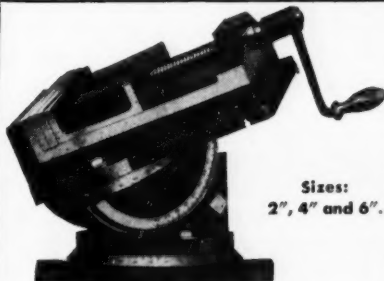
## Make 3 hammers AT ONCE!



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- Would your worker productivity increase if you could reduce plant noise?

**... then let us do something about the answers.**

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**"LOOK—NO LAGGING!"**

The NEW Leveling Barrymount can make profits for you out of problems you may have thought couldn't be solved. It represents a wholly new idea in mounting machinery. What it can mean to you in immediate profits is described in this new bulletin.

cutting wheels up to 26 inches in diameter x 5/32 inch thick. The wheel spindle speed ranges from 1,000 to 1,400 revolutions per minute.

### Instrument Provides Illumination for Inspecting Hard-to-Get-At Places

Badger Sales Co., Inc., 2251 W. Pico Blvd., Los Angeles 6, Calif., has announced the Model No. 512 HY 5X



"Inspecto-Scope"

Power Magnifying "Inspecto-Scope" which is designed for accurate and effective illumination and inspection of hard-to-get-at places. The instrument incorporates a chromatic lens and prisms which allow full five power

magnification without distortion. The eye lens is set in helical focusing mount for bringing in the image quickly and clearly. The focusing range of the unit is 2 inches, and the field of view is 3/4 inch. The instrument measures 17 inches in overall length and has a maximum reach of 14 1/2 inches. The minimum opening that will receive the instrument is 7/8 inch, without the bulb guard.

The instrument is illuminated by a 1.5-volt bulb and standard 1.5-volt battery. The light-carrying tube revolves 360 degrees and features a click-stop control. The Inspecto-Scope is supplied with battery, battery cable, bulb, and hardwood carrying case.

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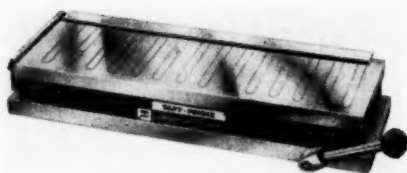




## Permanent Magnet Chuck Features Low Height

Designated as the "Superpower," a permanent magnet chuck which features a low height to provide maximum clearance between the wheel and the chuck has been announced by The Taft - Pierce Mfg. Co., Woonsocket, Rhode Island.

According to the manufacturer, the



Taft-Peirce "Superpower" Permanent Magnet Chuck

**NOW increased production and long life . . .**

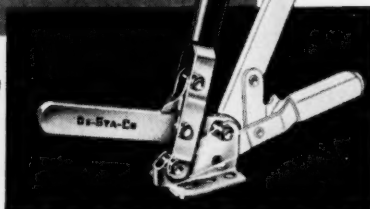
with

**"HARD-BUSHED"**



### TOGGLE CLAMPS

This is new—Destaco's new clamp design which gives you hardened bushings in all series 210, 220, 228 and 240 toggle clamps. The new bushings run full length through the clamp bars for a larger bearing surface—and they're deeply serrated to lock in position with no chance of turning in the bars. You get a minimum of wear, smooth, accurate snap action, even under tough production conditions. A feature of our heavier series for some years, this development sets new standards for tooling requiring 500 to 800 lbs. pressures. Further improvements have been incorporated in the "wrap around" construction which strengthens the base. For any fast clamping action in milling, drilling, welding, bonding, molding, riveting or bolted assembly operations—specify Destaco Toggle Clamps for pressures up to 4000 lbs. Consult our stocking representatives in your area, or select from our 36-page catalog describing over 45 models. Write for his name and your copy today.



chuck utilizes the latest developments in special alloy magnet material to achieve maximum power and, under normal conditions, will retain its peak energy indefinitely. Holding power is easily controlled by progressive positioning of a hand lever, from minimum to maximum, thus providing advantages in holding certain types of work without creating any distortion in the workpieces whatsoever.

Said to be ideal for use in surface grinding, the chuck can also be readily employed in other machining operations, such as light milling, planing, and shaping. Requiring no electrical connections or wiring, the chuck is readily portable.



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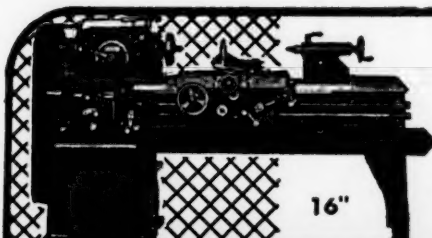
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This tool with  
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16"

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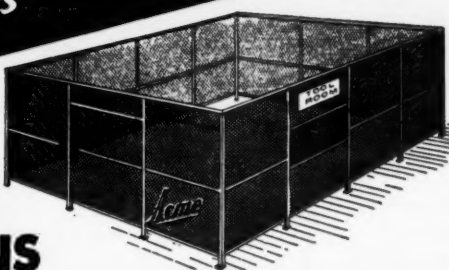
• This 16" lathe is equipped with 12 speed geared head, motor drive, and Timken mounted spindle. It's modern in design — with liberal dimensions.

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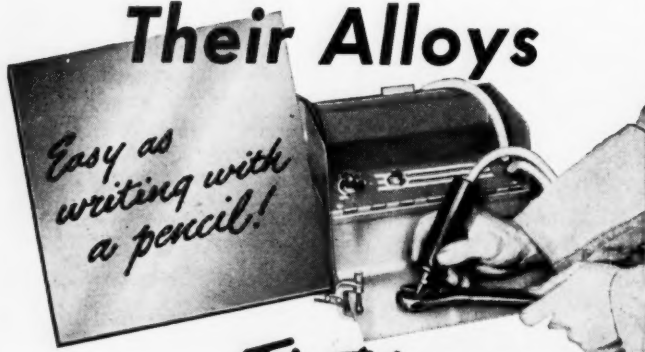
**Acme Wire & Iron Works**  
3527 E. Canfield — Detroit 7, Mich.

## Unit Utilizes Ultrasonic Vibrating Head

The Sheffield Corp., Dayton 1, Ohio, is now manufacturing the Cavitron Machine Tool, a unique device which utilizes an ultrasonic vibrating head and an inexpensive tool (such as soft steel) for the precision cutting of hard and brittle materials, either ferrous or non-ferrous, such as the carbides, germanium, hardened tool steels, sin-

tered aluminum oxide, quartz, industrial crystals, ferrites, various types of glass, ceramics, sapphire, and other materials difficult to machine. According to the manufacturer, the unit may be used for extremely precise external or internal machining similar to cutting, drilling, and grinding of holes, cavities, slots, and recesses of any shape, as well as precision forming of external profiles.

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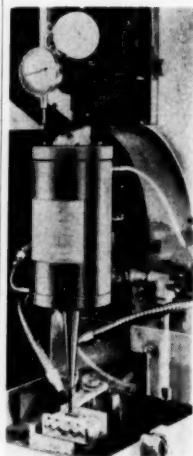
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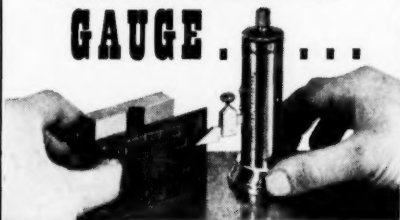
Cavitron Machine  
Tool set up to carve  
narrow slot in carbide  
blank

The ultrasonic tool head, it is claimed, vibrates from 18,000 to 30,000 cycles per second, producing

an unusually fine surface finish. No local heating of the work surface or chemical or physical change in the workpiece is said to take place.

TRY IT OUT!

## MICRO-HEIGHT GAUGE . . .



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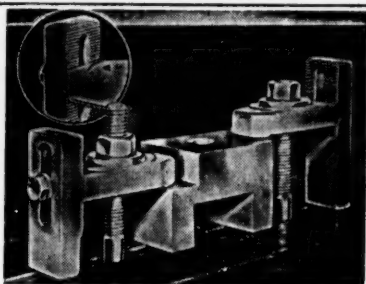
A new precision height gauge which reads like a micrometer and measures zero flush at base. Has a direct reading of 2" with scriber in upright position, and 3" with scriber reversed.

Replace scriber with dial indicator and Micro-Height Gauge measures center distances between holes or surfaces. As indispensable as a micrometer to toolmakers, layout men, and inspectors.

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## ACME TOOL CO.

73 W. Broadway, New York 7, N. Y.

## Pneumatic Work Holder and Hydraulic Ejector for Shear-Speed Shapers

Two devices are available as extra equipment on the complete line of Shear-Speed Gear Shapers built by Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. One device is a pneumatic holding mechanism built into the head of the shaper to allow for automatic positioning of the gear blank and clamping it in place during

### A Real Spring Winder!



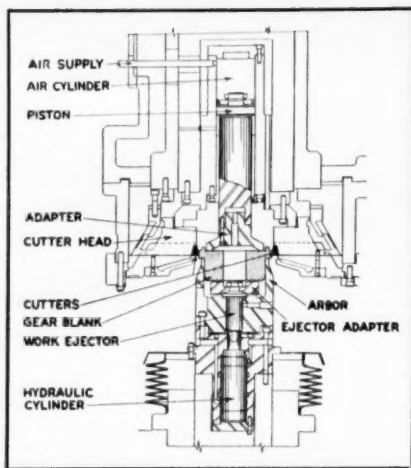
Will earn its cost in one day. The Hjorth Perfection Spring Winder offers the ideal means of winding extension, compression, torsion, taper, double taper, or left hand springs. Try one in your shop. You'll like it and the price is reasonable.

No. 1 Capacity 0 thru 3/32" wire \$1.50

No. 2 Capacity 0 thru 3/16" wire \$3.00

No. 3 Capacity 0 thru 5/16" wire \$5.00

**HJORTH LATHE & TOOL CO.**  
10 BEACON STREET WOBURN, MASS.



Cross-section cutaway drawing of Shear-Speed Gear Shaper with both the air clamping and hydraulic ejection setups incorporated into the machine

the shaping operation. The other device is a manually-controlled hydraulic unit which ejects the gear blank after the shaping operation is completed. The hydraulic ejector cylinder is mounted integrally with the reciprocating vertical ram which carries the work arbor. An adaptor attached to the hydraulic piston is raised against the lower face of the gear to eject it after the cutting cycle is completed. Only plant air is required in the air cylinder for clamping, eliminating the need for specialized equipment.

Cup-shaped sleeve adaptors are

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| <input type="checkbox"/> Aeronautical Engineering Jr. | <input type="checkbox"/> Hydro-Electric Power Plant    |
| <input type="checkbox"/> Aircraft Drafting            | <input type="checkbox"/> Industrial Engineering        |
| <input type="checkbox"/> Architecture                 | <input type="checkbox"/> Industrial Instruments        |
| <input type="checkbox"/> Architectural Drawing        | <input type="checkbox"/> Industrial Supervision        |
| <input type="checkbox"/> Automobile Mechanic          | <input type="checkbox"/> Machine Shop Practice         |
| <input type="checkbox"/> Auto-Elec. Technician        | <input type="checkbox"/> Mathematics                   |
| <input type="checkbox"/> Bookkeeping                  | <input type="checkbox"/> Mechanical Engineering        |
| <input type="checkbox"/> Building Contractor          | <input type="checkbox"/> Mechanical Drafting           |
| <input type="checkbox"/> Business Administration      | <input type="checkbox"/> Practical Accounting          |
| <input type="checkbox"/> Certified Public Accounting  | <input type="checkbox"/> Practical Electrician         |
| <input type="checkbox"/> Chemical Engineering         | <input type="checkbox"/> Reading Shop Blueprints       |
| <input type="checkbox"/> Civil Engineering            | <input type="checkbox"/> Reading Structural Blueprints |
| <input type="checkbox"/> Cotton Manufacturing         | <input type="checkbox"/> Radio Servicing               |
| <input type="checkbox"/> Diesel Engines               | <input type="checkbox"/> Railroad                      |
| <input type="checkbox"/> Diesel Locomotive            | <input type="checkbox"/> Railway Postal Service        |
| <input type="checkbox"/> Drafting                     | <input type="checkbox"/> Salesmanship                  |
| <input type="checkbox"/> Electrical Engineering       | <input type="checkbox"/> Stenographic Secretarial      |
| <input type="checkbox"/> Electrical Maintenance       | <input type="checkbox"/> Structural Engineering        |
| <input type="checkbox"/> Electronics                  | <input type="checkbox"/> Textiles                      |
| <input type="checkbox"/> Foremanship                  | <input type="checkbox"/> Toolmaking                    |
| <input type="checkbox"/> Television                   | <input type="checkbox"/> Tool Design                   |
| <input type="checkbox"/> General Radio                | <input type="checkbox"/> Traffic Management            |
| <input type="checkbox"/> High School                  | Other _____  |

Name \_\_\_\_\_ Age \_\_\_\_\_

Home Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

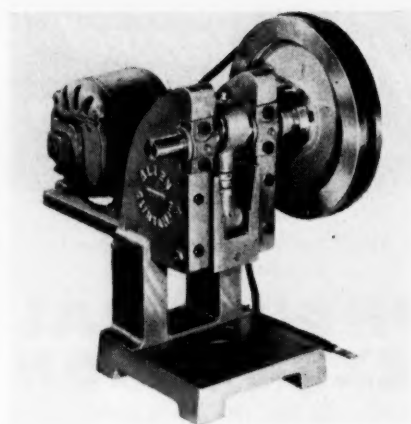
Occupation \_\_\_\_\_

Canadian residents address International Correspondence Schools Canadian, Montreal. Special tuition rates to members of U. S. Armed Forces.

fitted into a tapered hole in the bottom of the air cylinder piston. The adaptors fit over the top of the arbor when working on a hole gear, or over the end of the gear shaft, and move down to bear against the upper face of the gear. Mounting of the clamping adaptors is said to be quick and simple. According to the manufacturer, the pneumatic work holder affords quick and simple clamping operation, positive location, support for both ends of the work-holding arbor or integral shaft, and elimination of the problem of loose pieces in handling.

### Bench Model Punch Press Is Ideal for Short Runs

Alva F. Allen, Clinton, Mo., has announced a 1-ton bench model punch press which is said to be ideal for short runs or small work. The press features a single pin clutch which, it is claimed, provides positive clutching



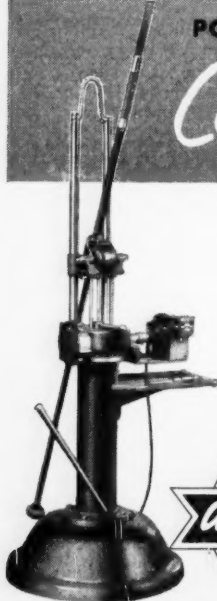
Allen Bench Model Punch Press

action and which is operated by a convenient hand lever. According to the manufacturer, the press has a capacity of up to 200 operations per minute on continuous operation. The ram of


POWER SCRAPER

*Cuts Production Costs...*

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One manufacturer was scraping flat pieces measuring 18 by 24 inches ... each piece requiring 5 hours to scrape by hand. An Anderson Power Scraper cut scraping time to 50 minutes! That meant a substantial saving in production costs and another happy Anderson customer. Let us help you estimate how much this portable, easy-to-use power scraper will save for you.



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ANDERSON BROS. MFG. CO., Rockford, Ill.

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**VERNIER CALIPER**

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**ELECTRIC BOX TYPE • FLOOR AND BENCH MODELS**

*For Tools and Small Parts*

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**THE COOLEY FLOOR MODEL  
for HARDENING AND TEMPERING**



Max. Temp.	Sizes	Price
2000°	12" x 8" x 18"	\$985 to \$1350
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All prices are less controls. Any standard controls available  
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the press is designed for accurate adjustment and moves on machined ways to afford accuracy in operation. A gib provides for take up of any wear. The press is operated by direct V-belt drive.

### Bench-Type Lapping Machine Operates at Four Surface Speeds

A bench-type lapping machine utilizing the figure 8 lapping motion is



Allen Figure 8 Lapp



### M-D Facing Heads With Automatic Feed

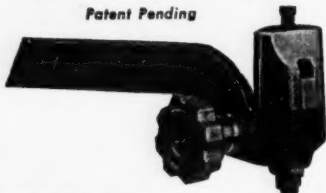
Can be attached to Boring Mill Bar, and Drilling or Milling Machine spindles. Single point tool travels radially, from center outward or reverse; feeds automatically. Sizes 6" to 46" diameter.

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### Monarch Precision SHAPLANE Radius Tools

Patent Pending



Five Models for

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RANGE  $\frac{1}{8}$ " TO 3" RADIUS (MODELS ALSO AVAILABLE FOR CONVEX CUTTING, AND CONCAVE RADIUS TO 6" ON PLANERS, ETC.)

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Tool Room Specialties**

4470 Oakenwald Ave., Chicago 15, Ill.  
Phone Drexel 3-3571

being distributed by Lupon, Inc., 1649 Sherwin Ave., Chicago 26, Ill. Known as the Allen Figure 8 Lapp, the machine operates at four surface speeds of from 250 to 1,000 inches per minute and is powered by a 1/3-h.p. driving motor which is connected to the mechanism by means of a V-belt and step pulleys. Serrated or smooth 8x12-inch lap plates of cast iron are used, the plates being easily interchangeable. Plates of other materials can be supplied on request.

Brackets in the base allow for the addition of special hold-down devices for multiple piece lapping or for the lapping of angled surfaces. According to the manufacturer, surface tolerances of less than 11.6 millionths of an inch are obtainable on most materials.



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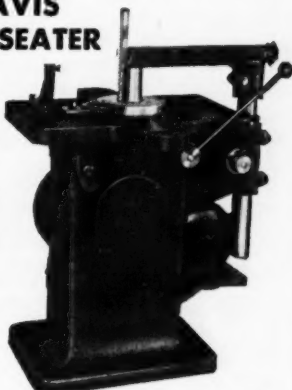
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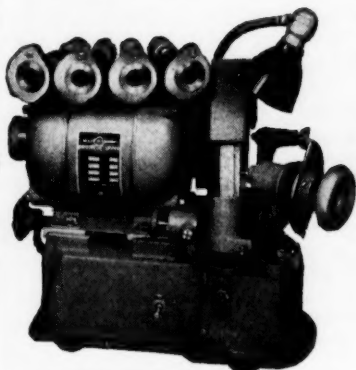
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precision  
**DRILL GRINDER**

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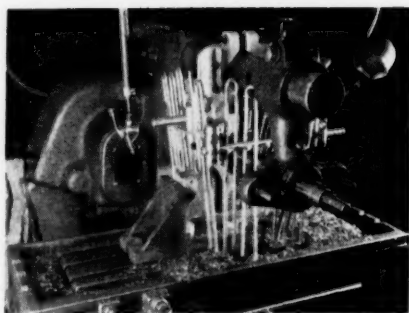
- ✓ Simple—fast—accurate
- ✓ Preferred by industry
- ✓ Web thinning attachment

*Black Diamond* **SAW & MACHINE WORKS, INC.**

71 NORTH AVENUE, NATICK, MASSACHUSETTS

## Guard Is Designed for Use on Milling Machine

Searjeant Metal Products, Inc., 87 Pittsford Rd., Mendon, N. Y., has announced a milling machine guard which is designed to prevent accidental injury to operators through fatigue, caught sleeves, gloves, rings, and so on. Said to be applicable to all makes and sizes of production mills, the guard incorporates adjustable vertical



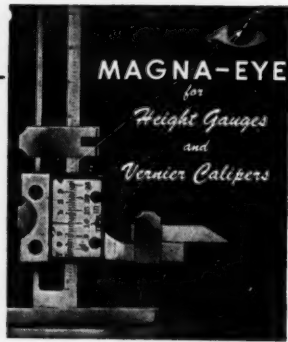
Searjeant Milling Machine Guard installed on a horizontal milling machine



### T-slot Bolts

The world's best . . . one-piece, drop-forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" length: 1/2"—\$1.36; 3/4"—\$1.36; 1"—\$1.58; 1 1/4"—\$1.89. Write for price list.

**THE O K TOOL COMPANY, INC., Milford 4, N. H.**



### MAGNA-EYE

for  
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and  
*Vernier Calipers*

MAGNIFIES the "hard to read" vernier scales on calipers and height gages. No more eye strain, guess work or hit or miss setting and reading. LENS is finest quality optical glass, specially designed and ground for the purpose with utmost optical skill. 4X magnification shows lines true and correct. In daily use in plants of Westinghouse, General Electric, General Motors, Chrysler, Packard, Ford, Boeing Aircraft, Bendix Aviation and many others engaged in defense work.

Made in 3 sizes to fit Starrett, Brown & Sharpe, Lufkin Tools, and others of similar design. \$ No. 100 for 6" Vernier Calipers; \$ No. 200 for 10"-12" Height Gages, also 10"-18"-24" Vernier Calipers; \$ No. 300 for most popular type 18" and 24" Height Gages and for 36"-48" and 60" Calipers.


For Complete Information Write, Phone or Wire  
**STEBAR COMPANY**  
711 W. Lake St. Minneapolis 8, Minn.

hexagon rods located close together to form a barrier around three sides of the milling cutter. Each rod is locked in place by a thumbscrew and is so designed so that it may be made smaller or larger to accommodate various jigs, workpieces, and milling cutters.

According to the manufacturer, the guard can be easily installed on existing mandrels or overarms by means of two heavy V-block castings which are locked in place wherever desired.

## Motorized Hardness Tester

Identified as the Y Model, a motorized hardness tester featuring a "Set-O-Matic" Dial Gage which eliminates the necessity for setting the large pointer at zero manually is now being marketed by Wilson Mechanical Instrument Division, American Chain & Cable Co., Inc., 230-G Park Ave., New



### broken tools made like new again with NU-TANGS

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Dividing Head**



**with  
DIRECT INDEXING**

Optional SWIVEL BASE converts a conventional dividing head into a universal work head or rotary table. Change-over is accomplished in seconds without tools or wrenches.

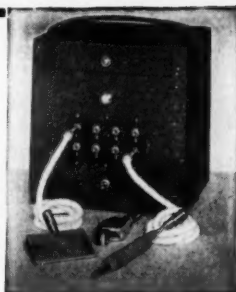
Also available in 10" - 12" sizes and in 10" - 12" spiral drive.

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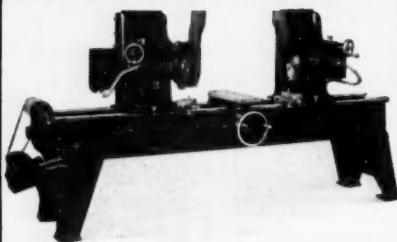
## **GRANT RIVETERS**



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## **"OLIVER" SEMI-AUTOMATIC Double End Miter Saw**



**Trims both ends of soft or thin metals smoothly, accurately, in half the time**

Cuts both ends square or at any angle up to  $45^\circ$ . Automatic feed—7 to 21 strokes a minute. Capacity: thin metal up to 2" high, 4" wide; 7" to 72" long. Motor-units have V-belt drive. Write for Bulletin 195-V.

**OLIVER MACHINERY COMPANY**  
GRAND RAPIDS 2, MICH.

York 17, N. Y. The tester is available in two types; namely, the YR and the YS (a superficial hardness tester). Each type can be supplied in four sizes with vertical gaps of  $3\frac{1}{4}$ , 8, 12, and 16 inches, respectively, and with horizontal reaches of  $5\frac{1}{2}$ ,  $5\frac{1}{4}$  to  $5\frac{1}{2}$ ,  $5\frac{1}{4}$  to  $5\frac{1}{2}$ , and  $5\frac{1}{4}$  to  $5\frac{1}{2}$  inches, respectively.

Supplied as standard equipment with the YR type are a  $\frac{1}{16}$ -inch steel ball penetrator check with 50 additional steel balls; plane, spot, shallow V, and "Cylindron Jr." anvils; dead weights

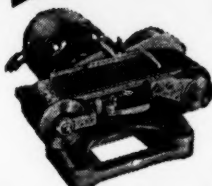


Wilson Y Model Motorized Hardness Tester

for applying 60, 110, and 150 kg. major load; two B scale and two C scale test blocks; vinyl plastic overall cover; telescopic sleeve set (cover) for elevating screw; and sub-sleeve for elevating screw. Supplied as standard with the YS type tester are one  $\frac{1}{16}$ -inch diameter ball penetrator chuck and balls for T scale testing; T and N scale test blocks; plane, spot, shallow V, and "Cylindron Jr." anvils; vinyl plastic instrument cover; protecting sleeve set; and sub sleeve.

**DOES IT BETTER  
DOES IT FASTER**

# **SIMPLEX-M ABRASIVE BAND GRINDER**



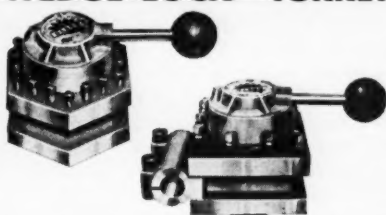
The precision of a machine tool plus the durability of a workhorse. Complete with 1/2 H.P. Heavy Duty Motor and automatic band tension control. Nothing like it for finishing metals, plastics, wood, fibre, etc.

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**NO. 150**

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MAGNETIC BASE HOLDER**

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Mounts to rods as small as 3/8" in diameter, with magnetic pull—125 lbs.

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Indicator post now firmly brazed to pole piece to insure solidity—an ENCO exclusive.



3-step universal rod in 1/8", 1/4" & 3/16" diameters, for all indicators.

✓ Offset clamp for lugback indicators.

✓ New fool-proof adaptor.

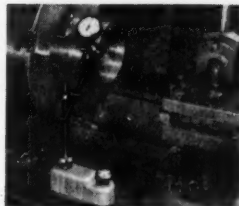
✓ Jack-type release & positioning screw.

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Case, non-breakable Tenite plastic, 1 1/4" x 4" x 1 3/4" high.



Pat.  
Pending



Shows Model No. 150 being used to indicate workpiece on engine lathe.

**Price \$15.50 Complete**

Send now for Bulletin No. 605 covering other Tiny-Titan Tools.

**ENCO MANUFACTURING COMPANY, Dept. 114**

4520-26 W. Fullerton Ave., CHICAGO 39, ILL.

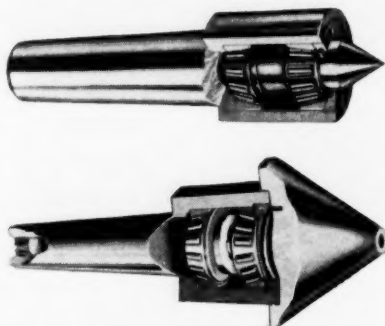
See Us at Booth 527 at A.S.T.E. Show in Phila.

Order from your Enco stocking dealer or send order with name of your mill supply dealer.

## Taper Roller Bearing Live Centers

Pace Engineering Co., 1507 E. Michigan St., Indianapolis 1, Ind., has announced a taper roller bearing live center which is available in two styles, one having a 60-degree standard spindle and the other having a 60-degree standard pipe spindle. Each style is available in various models with load capacities ranging from 1,000 to 6,400 lb. and with thrust ratings ranging from 500 to 3,260 lb. According to the

manufacturer, the spindle rotates within 0.0002 inch total indicator reading, and the spindle point is ground in its own bearings after assembly.



(Above) Pace Taper Roller Bearing Live Center with 60-degree standard spindle. (Below) Pace Taper Roller Bearing Live Center with 60-degree standard pipe spindle



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*protect*  
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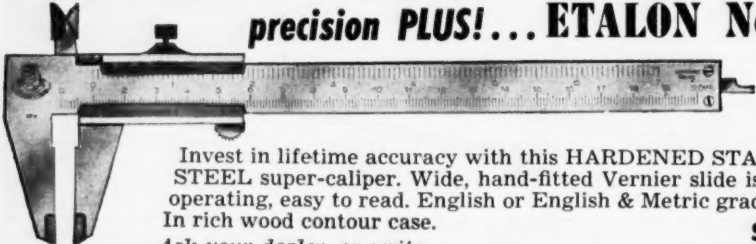
**DRILL and PILOT BUSHINGS**  
*Frictionless — Rotary*

For core drilling, T. C. and high speed boring, turret tool, piloting, etc. Won't stick or clog. Dust proof as a watch.

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**GATCO ROTARY BUSHING CO.**  
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The center incorporates a threaded retainer ring which is said to preload the taper roller bearings and provide for spindle alignment. A heavy-duty neoprene grease seal in the retainer ring forms a labyrinth seal against the entrance of foreign matter and retains the bearing grease. The center utilizes two taper roller bearings mounted in one housing bore. The shank is made from high quality steel, induction hardened for maximum strength and wear resistance and precision ground for fit.



**precision PLUS!... ETALON No. 17**

Invest in lifetime accuracy with this **HARDENED STAINLESS STEEL** super-caliper. Wide, hand-fitted Vernier slide is smooth operating, easy to read. English or English & Metric graduations. In rich wood contour case.

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### STRAIGHT EDGES

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# Machine Bases

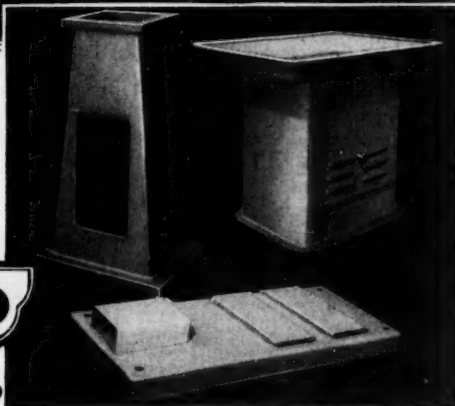
*Fabricated* **TO SPECIFICATIONS**

There's no substitute for "Accuracy" in the fabrication of Plate and Sheet Metal products, nor is there a substitute for "Experience" in the forming and welding of such products. With Littleford you can be assured of accuracy and experience in the fabrication of Machine Bases, Guards, Pans and Louver Covers. Littleford has been serving industry since 1882 and these years of skill and "know how" are ready to serve you too. See how fabricated bases can save you money. Send your blue prints for an estimate of cost or write for the Bulletin on Bases.



**LITTLEFORD**

LITTLEFORD BROS., INC.  
433 E. Pearl St., Cincinnati 2, Ohio



## Dual Air Valve Eliminates Accidental Strokings of Mechanical Press

A dual air valve which is designed specifically to eliminate accidental stroking of a mechanical press due to valve failure has been announced by Danly Machine Specialties, Inc., 2100 S. Laramie Ave., Chicago 50, Ill. The unit consists of two independent pilot-operated valves. The pilot valves are

actuated by electromagnets, and the main valves are actuated by air. Pilot valve construction is said to appreciably reduce inrush and holding current requirements. The two independent valves, it is claimed, are built into a single unit and cross-ported in such a way as to provide maximum safety.

According to the manufacturer, when either side of the valve is open, the other side continues to function normally through the independent action of its electromagnet, exhausting the clutch and bring-



*Star Performer  
In The Reamer Field*

**Staples**

**CARBIDE-TIPPED**

### SHELL TYPE EXPANSION REAMER\*

For maximum tool life with minimum tool servicing, put this Staples Shell Type Expansion Reamer on the job. Tool is returned to original diameter simply by driving the shell up the tapered arbor. Tool can be expanded many times without a re-grind. To obtain a new tool, just order a new shell—a standard stock item.

Standardize on Staples Carbide-Tipped Circular Cutting Tools. You'll get longer tool life—greater accuracy—finer hole finish—and spend less time on tool servicing. Staples is the *quality* name in carbide tool production. You'll save money in the *long* run with Staples.

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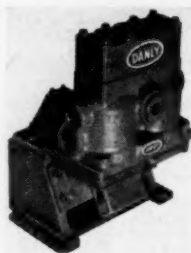
**THE STAPLES TOOL COMPANY, Cincinnati 25, Ohio**

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**CARBIDE-TIPPED CUTTING TOOLS**

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Expansion Reamers — Special Tools



Danly Dual Air Valve

ing the press to a fast, safe stop. The valve can be installed on a press with a pressure switch so that, should either side of the valve fail to function, the resulting drop in pressure in the air supply tank will break the control circuits and prevent further press operation until the trouble is corrected.



## ALLEN 1-TON POWER BENCH TYPE PUNCH PRESS

*A Rugged, Reliable Press  
for Small Work*



Price: \$125.00  
f.o.b. Clinton, Mo.  
(less motor)

### 30-DAY MONEY-BACK GUARANTEE

Full year warranty against defects. Send your order today. Price includes motor bracket, V-belt, motor pulley. Free circular.

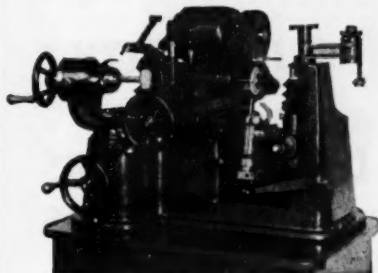
**ALVA F. ALLEN**  
DEPT. MM CLINTON, MO.

Cuts Costs and Saves Money On Stamping, Forming, Drawing, Etc.

Overall height—17½"  
Base size—8½" x 8½"  
Die bed—5½" x 8½"  
Ram face—1½" x 3½"  
Ram stroke—¾"  
Positive ¾" ram adjustment.

Sturdy, single pin, non-repeat hand lever clutch. V-belt drive. weight 105 lbs.

## HYBCO TAP GRINDER



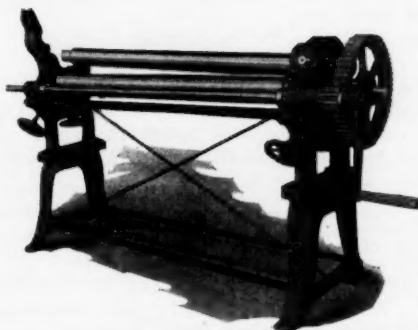
MODEL 1100

- Capacities No. 0 Machine Screw to 1½" Hand Taps.

**HENRY P. BOGGIS & CO.**

708 East 163rd Street  
Cleveland 10, Ohio

## Beloit SLIP ROLL HAND FORMING MACHINE



This Popular Beloit Slip Roll Forming Machine is supplied as single back geared hand operated rolls in bench type or floor type and double back geared floor type. Also supplied for power operation if desired.

The two feed rolls are geared together insuring positive feed of the thinnest material through the machine. Third roll is idle but can be furnished as gear driven.

Top roll is raised by quick acting cam lever for removal of completed cylinders. Release of lever returns roll to original position, ready for a duplicate piece.

Quality engineered and built for long, dependable operation.

Write for Catalog No. 14E today.

**HENDLEY & WHITEMORE CO.**

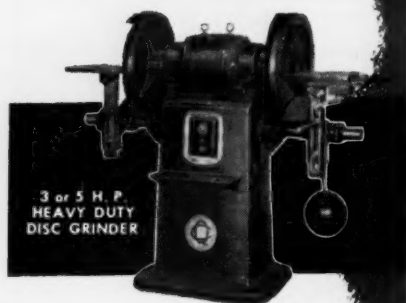
110 BLACKHAWK BLVD.

BELOIT, WISCONSIN

*Builders of Punches, Shears and Bending Rolls Since 1900*

# **"Time Savers in any shop"**

## **QUEEN CITY heavy duty DISC GRINDERS and BUFFERS**



Queen City Heavy Duty Disc Grinders and Buffers are designed for the hardest use. Extra heavy spindle, large, high quality ball bearings and special duty motors all contribute to long, trouble-free service.

The complete range of Queen City Grinders and Buffers . . . floor and bench types . . . in sizes from 1/3 to 10 H. P. . . is described in a free 24-page catalog.

Write for detailed literature



QUEEN CITY  
MACHINE TOOL CO.  
3911 Kellogg Avenue,  
Cincinnati 26, Ohio

"Queen City Grinders—Famous For Over 50 Years"

## **Assembly Rack Features Movable Brackets**

Of durable all-steel construction, an assembly rack which is available in regular or special sizes to fit individual box requirements has been announced by Sterling Factory Equipment Co., 183 Charles St., Providence, R. I. The uprights are slotted to accommodate movable brackets which permit boxes to slide out beyond the limits of the rack, as shown in the accompanying illustration. Runners are

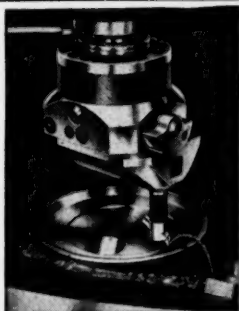


Sterling Assembly Rack

slanted to facilitate the flow of refill boxes from the rear. The rack will accommodate two boxes in depth and can be adjusted to individual specifications.

## **Chucking Reamers**

Chicago-Latrobe, 411 W. Ontario St., Chicago 10, Ill., has announced that its spiral-flute straight-shank chucking reamers are now available as standard in fractional sizes from 5/64 through 31/64 inch in increments of 1/64 inch. The reamers are also



## ONE Tool ONE Set Up

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facing, turn-  
ing, recessing,  
undercutting.

## MASTERHEAD

**THE BORING HEAD THAT  
THINKS FOR ITSELF**

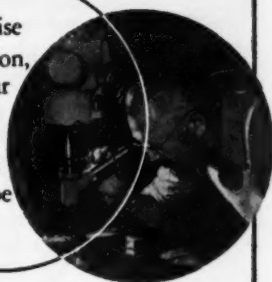
Featuring: automatic feeds, end release and return; adjustable stop; adaptable to all standard machines; highest precision; ideal for jig borers; nine models for work up to 36 1/4" diameter.

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hole location,  
easy contour  
inspection  
with new  
machine tool  
microscope



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- Mounts on offset bracket, or directly in the spindle
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- Image always appears erect and true
- Ideal for checking slots, contours, surface conditions, or transferring hole locations from template to workpiece.

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**THE PERKIN-ELMER CORPORATION**

Norwalk, Connecticut

## WALTON TOOLS

**TIME AND LABOR SAVERS FOR  
MACHINE SHOPS AND INDUSTRY**



### WALTON TAP EXTRACTORS

Cut costs of  
Removing  
Broken  
Taps

Universally used for removing stubborn, balky taps that break off deep in threaded work. Quick, easy, inexpensive. Will not damage threads. In 2, 3 and 4 flute styles—sizes No. 4 to 1 1/2".

### WALTON-AMERICAN TOOL HOLDERS

Save Time and Labor  
on Tool Changes.



Many holders in one. Head will swivel around an entire circle. May be set for straight, right or left hand offset positions. Will hold with perfect grip any size square or round tool bit or boring bar from 1/8" to 7/16".

### "\*REPS" PIPE & STUD EXTRACTORS

Reduce Labor Costs  
for Removing Pipes,  
Studs and Screws.

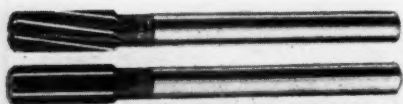


For removing broken pipes or studs that defy movement. "Reps" makes a strong four point grip without hammering or pounding. Hardened steel. Pulls rather than reams. In sizes, for every pipe from 1/8" to 2", every stud and screw from 3/8" to 3 1/2".

(\*Reps. Tool Company, Inc., a Walton affiliate.)

Sold by leading dealers, or write direct for catalog No. 10 of Walton Tools and details of 30 day free trial offer.

**THE WALTON COMPANY, Hartford 10, Conn.**



(Top) Chicago-Latrobe Straight-Flute Straight-Shank Chucking Reamer. (Bottom) Chicago-Latrobe Spiral-Flute Straight-Shank Chucking Reamer

available as standard in straight-flute straight-shank types in fractional

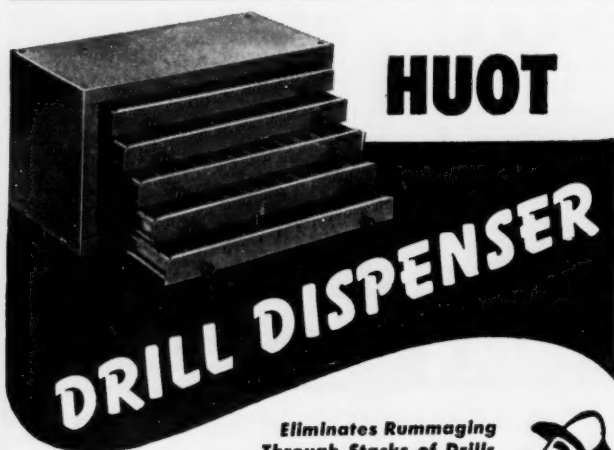
sizes from 3/64 through 31/64 inch; wire gauge sizes from No. 1 through No. 6 inclusive; letter sizes from A through Z inclusive; and decimal sizes from 0.124 to 0.501 inch.

### Electrode Incorporates Powdered Metal into Electrode Coating

Designated as "Jetweld," an electrode which is a heavily coated shield-

ed-arc type for operation in flat or near flat positions with alternate or direct welding current has been announced by The Lincoln Electric Co., Cleveland 17, Ohio.

Incorporating powdered metal into the electrode coating, the electrode is said to meet the physical requirements of class E-7016 and is used on work formerly calling for E-6012 and E-6020 electrodes on single pass or multiple pass welds. According to the manufacturer, typical physical properties, as welded, are tensile strength of 93,000 p.s.i.; yield point of 79,000 p.s.i.; and elongation in 2 inches of from 15 to 22 per



**Eliminates Rummaging Through Stacks of Drills**

No more running out of drills—your entire stock can be seen at a glance. Each size of drill has its own compartment with rounded bottom for easy selection. You can store dozens of small drills and several large ones in their own compartments. Built-in pricing or inventory system eliminates the need for cost sheets, and will keep a record of drills on hand. Stack two or three cabinets to save space. Specifications: 14½" long, 7¼" high, 7¼" deep. Hammerlin baked enamel finish over rugged steel. *Write for bulletin.*

**Made in three models for fractional, number or letter drills.**

"HUOT" is pronounced "HEW-OT"

**HUOT MANUFACTURING CO.**

538 N. Wheeler St., St. Paul 4, Minn.



By the  
makers of  
**HUOT  
DRILL  
INDEX**

**BREMIL**  
The IMPROVED Compound Lever Shears

ALL ALLOY  
FULLY  
GUARANTEED



Two Sizes

**PORTABLE**  
No. 1 cuts up to No. 11 gauge strip or sheet  
No. 2 cuts up to 1/4" steel plate.

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GROUND HSS BLANKS**

Any decimal diameter to 3/8" — in any length.  
Mirror finish surface to gage tolerance. Many  
uses — punches, gages, measuring wires,  
special tools, etc. Quick delivery.

Write for price list D-2  
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**Clark**  
**ADJUSTABLE  
HOLE  
CUTTER**

Finished cuts the first  
time in boiler plate,  
pipe, plastics, hard  
fibre, stainless steel,  
Transite, etc. 7 models  
cut variable expansions  
from 5/8" to 5" holes, with  
thickness capacities  
from thin sheets to 1".

MM-1

For complete information call your Clark  
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Manufacturers of Precision Cutting Tools

**CUT  
PLASTIC,  
WOOD, SOFT  
METALS—  
WITH NEW  
SPEED  
AND  
EASE  
WITH**



**Atlantic**

**SKIP-TOOTH  
BLADES!**

Keep abreast of changing production techniques! A finer, quicker cut on increasingly popular plastic — wood — copper — aluminum — and similar metals is YOURS with versatile Atlantic Skip Tooth Blades. Atlantic's extra wide tooth spacing whisks away chips — ends clogging! binding! heating! The rigid set of individually gauged teeth, the advanced skip tooth design promote increased accuracy and greatly prolonged blade life. Heat hardened teeth on special steel body eliminate most costly blade breakage, damaging crystallization. Whatever your blade requirements are — or may be — investigate the Atlantic Skip Tooth — another triumph of Atlantic adaptability and efficiency.

SEND TODAY FOR LITERATURE ON  
SUPERIOR ATLANTIC BAND SAWS!

**Atlantic**  
ATLANTIC SAW MFG. COMPANY, Inc.  
Brewery St., New Haven, Conn.

ATLANTIC

cent. Charpy keyhole impact value at room temperature is said to be 28 foot pounds and 20 foot pounds at minus 70-deg. Fahrenheit.

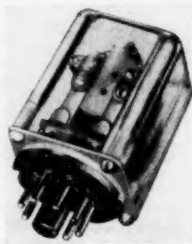
Bead appearance, it is claimed, is smooth, and the slag produced curls off as it cools to make the welds practically self-cleaning. Said to be especially suited for horizontal and flat position fillets, horizontal and flat position laps, single and multiple pass

butts, deep grooves and corners, and cover pass on multiple pass butts, the electrode is available in 5/32, 3/16, and 1/4-inch sizes.

### Plate-Circuit Relay Is Enclosed in Clear Polystyrene Dust Cover

Potter & Brumfield, Dept. MS, Princeton, Ind., has announced the

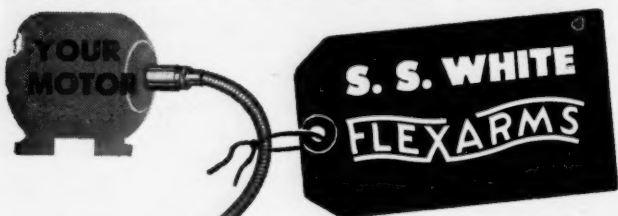
"KCP" Plate-Circuit Current-Actuated Plug-In Relay which is enclosed in a clear polystyrene dust



Potter & Brumfield  
"KCP" Plate - Circuit  
Plug-In Relay

cover and equipped with an octal plug. The relay is intended for use in photoelectric cell or similar circuitry, such as automation equipment. The relay has a contact rating of two amperes, 115 volts, a.c. non-inductive load and an operating coil power of 125 milliwatts per movable pole.

### Hundreds of PROFITABLE USES for-



### Use these versatile flexible shaft tools

for all kinds of shop work including die sinking, polishing, reaming, grinding and similar jobs. They're quickly and easily coupled to any electric motor with 3/8" or 1/2" diameter spindles.

They come in two sizes. The 700 Series for precise, delicate work use .092" shank diameter tools. The 500 Series for heavy duty service use tools with shank diameters up to 1/4".

WRITE FOR THIS CATALOG. CATALOG T-51 describes Flexarms and many other S. S. White tools for industry. Send for your copy today.



**THE S. S. White INDUSTRIAL DIVISION**  
**DENTAL MFG. CO.**



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NEW YORK 16, N. Y.

Western District Office • Times Building, Long Beach, California



## NEW! CHAMFER MICROMETER GAGE

PRICE **\$83.50**  
(0°-90°)

Order one on a free trial basis.

Accurately, Directly reads End Diameters of Chamfers up to 1"—Included Angle Maximum Chamfer. Chamfer Depths Also Easily Computed.

Available in 0° - 90° and 90° - 127° Models.

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● A Boring Head That Won't Face Is Not Complete

NEW—Re-designed . . . Added

Features . . . Six Sizes

Boring, Facing, Turning, Grooving, Undercutting—in One Head

CHANDLER TOOL COMPANY, Muncie, Indiana

**Chandler-Duplex**



ALL Sizes Have Power Feed for Facing

Write today for complete details.

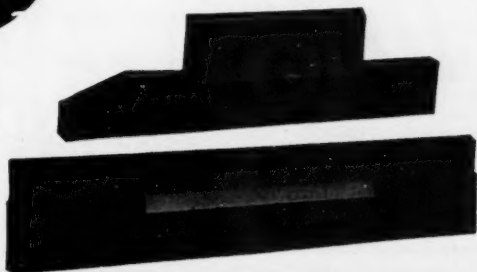


**CARBIDE TIPPED**  
Work Support Blades  
for CENTERLESS GRINDERS

Standard thrufeed and infeed work support blades available from stock. Prices on special blades quoted on receipt of prints. We retip and regrind. Let us salvage your worn blades.

#### SPECIAL TOOLS

Prompt quotes on receipt of your prints.



**WILLEY'S CARBIDE TOOL CO.**

Sole Makers of WILLEY'S MARK

1342 W. Vernor Highway

Detroit 1, Michigan

## Adjustable Copy Holder for Use on Engraving Machines

Designated as the "Panto," an adjustable copy holder which is designed for use on engraving machines and which is comprised of a base plate and units that are said to permit individual spacing of each slide for multiple line engraving has been announced by H. P. Preis Engraving Machine Co., 188 Industrial Branch, Hillside, N. J. The complete assembly consists of one



Preis "Panto" Adjustable Copy Holder

flat copy holder plate, one center copy slide with double-ended T-square, and

two single copy slides. The flat copy holder is mounted to the engraving machine in the same manner as a standard copy holder. The center copy slide fits over the plate and can be locked in any position across the plate. The single slides are attached to the cross bars of the center slide and can be adjusted to any desired spacing and locked in position. The complete unit can then be moved across the copy holder plate without disturbing the copy slides.

The Preis "Panto" Adjustable Copy Holder is divided into three combining groups of units designated as copy holder units, single copy slides, and

## For SPECIAL BROACHES QUICK, AT LOW COST— du MONT



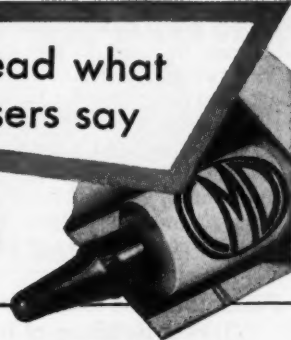
Broaches like these, and many other pull-type, push-type and keyseating machine broaches fit our regular production tooling on the famous *Minute Man* Keyway Broaches.

That's why we can make 'em for you quicker and cheaper. So send us your specs. or prints.

Note: We cannot make broaches longer than 36" or with cutting sections exceeding 20"; nor round, spline, rifling or irregular shaped broaches, nor square broaches less than 1/4" across flats.

## The du MONT Corporation

Greenfield, Mass.

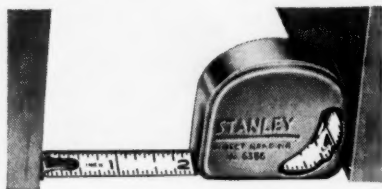


variable copy slides. The copy holder unit may be used on any type or size of engraving machine. The copy type sizes that may be used in combination of sizes or individually range from  $\frac{3}{4}$  to  $4\frac{1}{2}$  inches, and provision is made for "jump slide spacing," permitting the use of up to 10-inch copy type, emblems, or master designs in combination with smaller sizes of copy type.

### Flexible-Blade Rule Provides for Direct Reading of Inside Measurements

Designated as the "Pull-Push" No. 6386W, a flexible-blade rule designed for taking accurate inside and outside measurements and featuring direct reading of inside measurements has been announced by Stanley Tools, New Britain, Conn. A red indicator on the window of the case points to exact inside measurements on the white blade when the case butts against the

work and the blade is extended, eliminating the need to add the width of the case. The rule incorporates clear



Stanley "Pull-Push" No. 6386W Rule

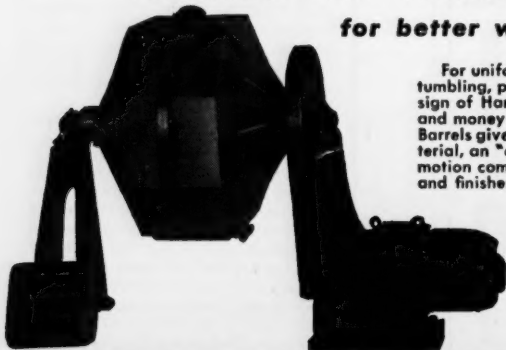
black graduations and numbers on a baked white enamel surface.

The rule is 6 ft. long and utilizes a flexible, rigid blade  $\frac{1}{2}$  inch wide. The blade is graduated in 16ths on both edges for the entire length and in 32nds on the upper edge for 6 inches. The case measures 2 inches and is nickel plated with a brushed stain finish.

### HARTFORD TRIPLE ACTION

### CUTTING and TUMBLING BARRELS

*for better work in less time!*



For uniform cutting down, wet or dry grinding, tumbling, pulverizing and mixing, the unique design of Hartford Triple Action Barrels saves time and money and produces better results. Hartford Barrels give a TRIPLE ACTION in tumbling the material, an "over and over, end to end, folding-in" motion combined, which quickly grinds off burrs, and finishes and smooths the general surface of any article in the load. These barrels are available in two sizes, large and small, and with both motor and belt drive. Hartford also makes steel burnishing balls scientifically correct in design and material for each specific job. Bulletin on request.

2H552

## THE HARTFORD STEEL BALL CO. HARTFORD 6, CONN.

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VICTOR R. CLARK  
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NEWARK, N. J.  
GUARANTEE TRUST BLDG.  
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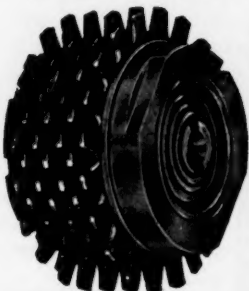
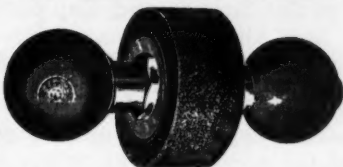
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R. A. RODRIGUEZ, INC.  
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Balanced . . . Free Running . . . High Speed  
Crushing and Wheel Forming Action . . .  
For SHARP, CLEAN, OPEN WHEEL FACES



### MODEL 1943 CC ASSEMBLY

STEEL CUTTERS  
For Surface  
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Complete  
Assembly \$ 7.50  
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Made by the World's Largest Manufacturers of

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KNIFE GRINDING MACHINERY**

**HANCHETT MANUFACTURING CO.**

BIG RAPIDS, MICH.

MM-112

PORTLAND 4, ORE.



**Engineered Live Centers** . . . A properly designed Live Center is one of the fundamentals of setting up a job and requires a specialist's experience. Characteristic of the design of all STURDIMATIC LIVE CENTERS is a low overhang and a slight cushioning action that compensates for expansion due to heat shock and excessive thrust loads—reducing wear to a minimum. Send us your blueprints and specifications—we will see that your job is set up with the right Live Center. Standard shanks with Morse taper carried in stock.

**STURDIMATIC  
TOOL COMPANY**

1904 F. STREET • DETROIT 16, MICH.

## Improved Types of Point Applied to Set Screws and Cap Screws

The Allen Mfg. Co., Hartford 2, Conn., has announced two improved types of point, one applied to set screws and the other to cap screws. A smaller cup point for set screws, called the Allenpoint, will replace A.S.A. cup point set screws in the standard Allen line. The Allenpoint is said to demonstrate greater locking at all measured installation versus removal

torque pressures, uniformly high shaft-holding power in torque resistance tests, unusual performance under vibration, and more complete shaft contact pattern. The Allenpoint set screw is available in Allenoy and stainless steel, with either N.C. or N.F. threads. The firm's standard line of oval, flat, cone, and dog point set screws will continue to be available as standard.

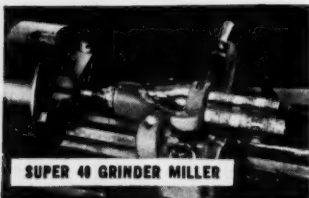
An unthreaded leader point has been developed for Allen cap screws, de-

signed to reduce substantially the cause of screw thread injury and damage to threaded holes.

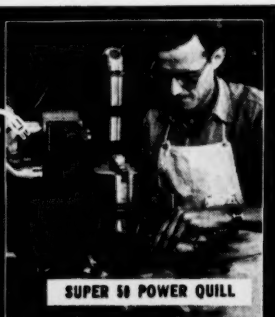
# Precise LOWEST COST PRECISION

## FOR TOOL ROOM AND PRODUCTION

UP TO 45,000 R.P.M. AND 1/4 H.P. ON AC/DC. Only PRECISE has the speed, power and precision needed to turn Tungsten Carbide Mills as well as all other rotary tools with shank diameters to 1/4". Grind, mill, finish, polish any material from wood to the hardest alloy steel. MODELS SUPER 30 and SUPER 40 are for hand applications or machine set-ups; PRECISE SUPER 50 is for heavy duty in machine set-ups. Precision quills and chucks; lifetime-lubricated, micro-precision bearings; machined metal housings. Mounts and accessories for each model extend versatility on standard machine tools.



SUPER 40 GRINDER MILLER



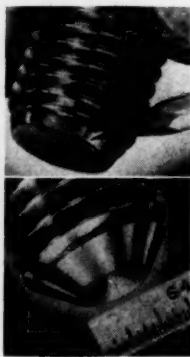
SUPER 50 POWER QUILL



PRECISE SUPER 30  
45,000 R.P.M.  
and 1/4 H.P. in 35  
oz. Draw collet.

Write FOR CATALOG

PRECISE PRODUCTS CORP. 1345 Clark St., Racine, Wis.



(Above) Illustration showing unthreaded leader point designed to make Allen cap screws easier starting. (Below) Illustration showing smaller Allenpoint cup which is said to afford set screws improved performance

Improved lineup, particularly in inaccessible spots, and protection from damage resulting from dropping or knocking against



People work better when they SEE BETTER



**In the General Electric Plant**  
*Magni-Focuser helps a worker make adjustments on precision equipment.*

MAGNI-FOCUSER'S matched prismatic lenses give needle-sharp magnification. Comfortably light weight. Fits over regular glasses. Leaves both hands free. Normal vision may be resumed by lifting head.

Gives true third-dimensional ("3-D") vision

## MAGNI-FOCUSER

**SPEEDS PRODUCTION**

**Leaves both hands free to work**

Magni-Focuser—the binocular magnifier—reduces eye-strain and prevents squinting—thereby speeding production, increasing accuracy and minimizing the chance of errors and accidents.

Gauge reading, layout work, inspection, tool and die work are just a few of the jobs that need the Magni-Focuser. Speeds precision assemblies, blue print work. Restores the usefulness of the skilled hands of many older workers whose vision needs a seeing aid.

Magni-Focuser can help your plant produce better. Immediate delivery. 10-day trial without obligation. Return to us if not satisfied. \$10.50.

**Send for descriptive folder**

**EDROY PRODUCTS CO.**

480 Lexington Ave.,  
Dept. P, New York 17, N. Y.



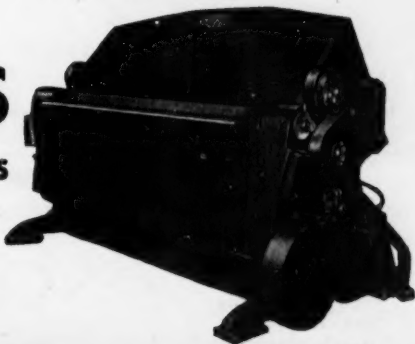
**STEEL HAND and POWER**

## BENDING BRAKES

**for Single and Quantity Runs**

**BENDING STEEL PLATE  
and SHEET METAL**

**Special Bending Brakes  
Double Folder Brakes**



**DREIS & KRUMP**  
MANUFACTURING COMPANY

7418 S. Loomis Boulevard, Chicago 36, Illinois



other metal surfaces are claimed for the improved leader point, which will be a standard Allen cap screw feature.

### Mechanical Comparator Provides Magnifications up to 3000X

Cosa Corp., 405 Lexington Ave., New York 17, N. Y., is now marketing the Sigma Vertical Mechanical Comparator which is designed for

checking dimensions of parts at the production line, in the toolroom, or in the inspection department. The instrument is said to provide magnifications of 500X, 1000X, 1500X, and 3000X and capacities of 6 and 12 inches in each magnification. All moving parts are mounted in ball bearings to minimize friction and wear. Vertical adjustments are provided for the head and table, final setting being accomplished on the scale.



- Saves back injuries, lifting heavy dies and materials.
- It costs so little and saves so much time in shopwork.
- Automatic brake holds load at any height.

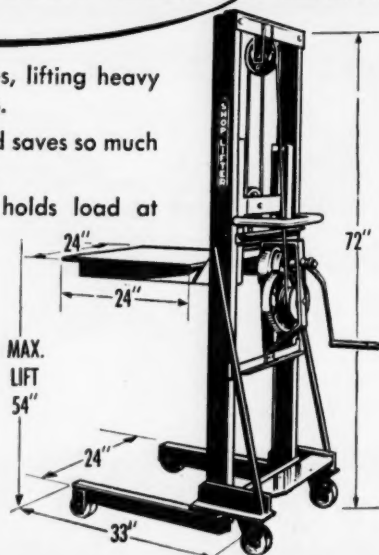
Type D—Capacity  
500 lbs. \$183.60

Type DX—Capacity  
1000 lbs. \$349.52

Type DX—Capacity  
2000 lbs. \$417.52

Floor lock included  
Prices net  
F.O.B. Chicago

The battery powered,  
hydraulic lift, WORK-  
LIFTER, capacity 750  
lbs. available at \$695.



**ECONOMY ENGINEERING CO.**

4507 West Lake Street  
Chicago 24, Illinois

According to the manufacturer, uniform measuring pressure on the measuring spindle provides



Sigma Vertical Mechanical Comparator

accurate readings over the entire scale range from 0.012 to 0.002 inch. Adjustable limit indicators can be locked in position if desired. The throat depth of the comparator is 3 1/4 inches, and the anvil table is reversible.

## COLLET TYPE PIN GAGE HANDLE

Bushings for cylindrical and thread plug gages.

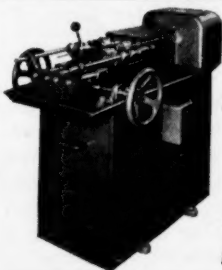


RED

GREEN

Complete line of gage supplies, handles, blanks, ring gage parts, etc. from stock.

**HURON MACHINE PRODUCTS INC.** 6252 Monroe Boulevard  
DEARBORN, MICHIGAN



*for rapid threading*  
**OF SCREW BLANKS AND SIMILAR PARTS**

## The KENT 2-Spindle BOLT THREADER

Alternate feeding to two spindles. Continuous operation. Large output. Low Costs. Change-overs made quickly. Minimum skill required.

Write for illustrated literature.

**The KENT MACHINE CO.,** Cuyahoga Falls, O.  
Drillers - Threaders - Slotters - Countersinkers - Bar Pointers

# STOP DUST With DUSTKOP



300 cfm to 10,000  
cfm per unit (22  
models) standard,  
pre-tested, available  
from stock.

Low cost, immediate control of dust from  
one remote dust source, or from a whole  
shop!

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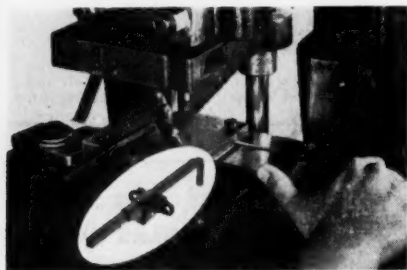
Ann Arbor, Mich.

Ask for catalog  
605-2

No obligation.

### Universal Automatic Stop Is Adaptable to Any Type or Size of Die

R. Krasberg & Sons Mfg. Co., 2511 W. Homer St., Chicago 47, Ill., has an-



Krasberg Universal Automatic Stop installed on a die

nounced a universal automatic stop which is designed to suit a wide variety of applications. Available in two sizes with right or left-hand feed mo-

dels in each size, the stop is claimed to be capable of working on any kind of die and accommodate all jobs up to the very large dies which would ordinarily require custom-made stops.

Easily and quickly installed, the stop is attached to the front of the stripper with two screws. A hole is drilled for the arm at the gaging position. A spring is built into the stop to provide pivotal action, as well as side movement or "side wiggle," thus assuring proper positioning of the stop finger on the face of the work after each punching operation.

### Bench Press Delivers 5-Ton Pressure

Identified as the Model 500 "Pneumatic," a bantam-size air-oil combination hydraulic bench press which is said to be capable of delivering five tons of pressure when connected to a 100 p.s.i. air line has been developed

---

**IF...** You Specify or Make Stamping Dies  
**THEN** You will want to know about The Cerromatrix  
Method of Punch and Die Setting. This method will:

Save you money—as much as 500 man-hours saved in production time on complicated dies.

Save you time on delivery—

Give longer, trouble-free service.

Write now for Data Sheet A15



**CERRO DE PASCO CORPORATION**

Dept. 10, 40 Wall Street, New York 5, N. Y.

# metal chippings...



by  
Frans Ls. Meyjes, C. E.

*Some of the professional pessimists have been pointing out that steel—always a good business barometer—is down in capacity. While this is true, the fact is that the industry is producing more steel than it did a year ago. Steel capacity at its present 95% is even better than what it was during the peak war period. At that time it never went higher than 94%.*

★ ★ ★

**SHOP TIP:** Try tying the mouth of a closely woven cloth bag around the exhaust end of the coolant pipe of your grinders when you grind cemented carbide tools with ASCO Superbond diamond wheels. Remove bag when using other types of grinding wheels. You'll find the bag retains only diamond sludge from which it's easy to reclaim the diamond particles.

★ ★ ★

If you haven't seen details on the 1954 Leonard J. A. Smit Memorial Award competition to discover new uses for diamonds in industry, write the ASCO Award Committee. \$2000 in prizes are at stake.

Frans Meyjes, Vice President in charge of Production of ANTON Smit & Co., Inc., is also director of the Applications Engineering Division. The purpose of this division is to furnish free technical help to the metalworking industry on its specific industrial diamond tooling, production and application problems. Call on your local ASCO Applications Engineer—or write the ASCO World Headquarters in New York—if you'd like to discover how putting diamonds to work for you can save valuable production dollars.

**ANTON Smit & Co., Inc.**  
333 West 52nd St. • New York 19, N. Y.



January, 1954

**NUMBERALL**  
CUTS THE COST OF STAMPING NUMBERS

## Model 70

### Multi-Wheel Numbering Machine

Machine and Shank  
All One Piece.

The most efficient method of stamping numbers into metal. Repeats the same numbers until changed. Model 70 NUMBERALL Machines are used in all industries to mark various parts. Stamps numbers, etc., quickly... neatly. Perfectly aligned. Much better marks are produced by these machines than by single stamps or steel type, and at a far lower cost. Shank for Hand or Press and with any number of wheels from 3 to 20.

Write for  
Bulletin MS-70.

### IMPROVED TYPE HOLDERS

Hand or Press style. Type can be easily, quickly loaded and unloaded. Simplest construction... Just a sturdy pin holds the type securely. No screws nor springs. Super-quality steel type made in various sizes: 1/32" up to 1/2" figures and letters.



Write for Bulletin MS23H

Steel Type

**NUMBERALL STAMP & TOOL CO.**  
HUGUENOT PARK STATEN ISLAND 12, N. Y.

MODERN MACHINE SHOP 359

by Alliance Mfg. Co., Alliance, Ohio. The press contains no motor and uses no electric power, pumps, or cooling water. An air filter protects the unit from damage caused by pipe scale and dirt in the air line. The press features a sturdy all-steel welded frame and a minimum of moving parts. Pressure for the hydraulic unit is generated by an integral air-actuated booster. The press operates on the dual pressure system, the ram being lowered and

raised under low pressure with the high pressure kicking in only during the short distance required to perform the operation.

Having a pressure range of from 100 to 10,000 lb., the press operates under a preset amount of exerted pressure, thus enabling parts of varying thicknesses to be assembled with uniform results. A conveniently-located hydraulic pressure gage affords the operator a means of visually checking power exerted. The press is provided with an automatic timer for cycle control and dwell time at the



### *How Cutting from a Template is Simplified with a CAMPBELL Nibbler*

• With CAMPBELL Nibbling Machines the cut can be made in any direction without head adjustment. The operator can feed the work with both hands following a template clamped above the work.

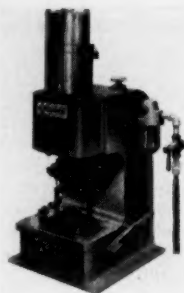
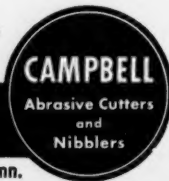
These machines leave a relatively smooth edge, which requires little finishing. Various models cut all thicknesses of metal up to  $\frac{1}{2}$ ". Variable cutting speeds. Drive is completely enclosed for safety.



**CAMPBELL makes a complete line of Nibblers. Write for literature.**

**CAMPBELL MACHINE DIVISION  
AMERICAN CHAIN & CABLE**

931 Connecticut Ave., Bridgeport 2, Conn.



Alliance Model 500  
"Pnu-draulic" Bench Press

bottom of the stroke. The stroke is adjustable from 3 inches to zero. According to the manufacturer, the press is ideal for staking, riveting, forming, piercing, crimping, sealing, broaching, trimming, marking, and flanging.



### Machine Is Designed for Rough and Micro Finishing Operations

Designated as the Vari-Tool, a finishing machine which is capable of rough and micro finishing high-speed steel or carbide tools has been announced by The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio. The right-hand side of the machine is a compact assembly consisting of three pulleys to accommodate a 54x4-inch abrasive belt which is protected with a steel guard. A conveni-



Standard Vari-Tool Finisher

ent torque screw for adjusting belt tension is provided, and simple table adjustment is said to provide access for mounting a new belt. The left-hand side of the machine accommodates a 6-inch diameter (Type 2) plate-mounted cup grinding wheel for the roughing operation. The grinding wheel is protected by a steel guard which is adjustable for wheel wear.

Each side of the machine is equipped with a 10x7-inch tilting table with graduated indicators. The machine utilizes a  $\frac{3}{4}$ -h.p. 3,600-r.p.m. motor.

**Improved**

**L&J PRESSES**  
*Better-Built for  
Better Work*



L&J Presses are producing work of better quality in larger volumes and at reduced costs for countless manufacturers. Here's why they do it:

- More rigid frames for minimum deflection.
  - Bronze bushings on main and ram bearings.
  - Roller bearing flywheel or main gear.
  - Precision-scraped gibs of extra length.
  - Balanced design—precision manufacture.
- 17 models—6 to 80 tons. Air clutches available. Write for literature.



## 16-Inch Band Saw Has Speed Range from 50 to 4,500 S.F.P.M.

A variable-speed 16-inch band saw having a speed range of from 50 to 4,500 s.f.p.m. has been announced by Walker-Turner Division, Kearney & Trecker Corp., Dept. MM11, Plainfield, N. J. Speed change is effected through a handwheel operating a variable diameter pulley which is connected to

the saw wheel through a gear train. A gear-shift lever, having two positions, controls the high or low speed range.

The low range operates at from 50 to 450 s.f.p.m. and the high range at from 500 to 4,500 s.f.p.m. According to the manufacturer, speed changes can be made while the machine is running.

Designed for use on all types of ferrous and non-ferrous metals, plastics,

wood, and composition, the machine has a capacity under the guide of 18 inches and from blade



*Made to your Order...*

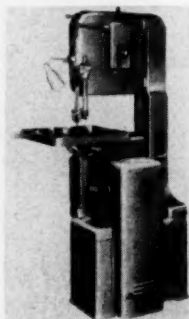
# FULLER

*Cutting Tools*

**SPECIAL, HIGH-PRECISION  
HIGH-SPEED STEEL & CARBIDE TIPPED**

**FULLER TOOL CO.**

4000 WEST ELEVEN MILE RD.  
BERKLEY, MICH. LINCOLN 2-5600



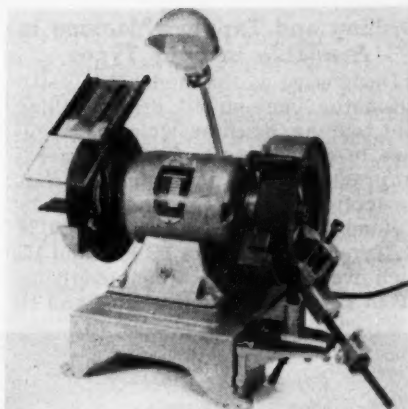
Walker-Turner Variable-Speed 16-Inch Band Saw

to blade measures 16 inches. The table tilts 45 degrees to the right and 5 degrees to the left. The motor is spring-mounted in the base. Other features of the machine include guides that support the blade at the point of contact and Carter Quick-Change Tires.

### Grinder Points and Sharpens Wide Range of Twist Drills

The Swanson 3-in-1 tool and drill grinder which is said to be capable of quickly and accurately pointing and sharpening a wide range of twist drills from No. 60 wire size to  $\frac{3}{4}$  inch is being distributed by The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. According to the manufacturer, the grinder is capable of grinding point angles from 45 to 75 degrees, clearance angles from 6 to 15 degrees, and chisel point angles from 117 to 135 degrees. The unit, which incorporates a  $\frac{1}{4}$ -h.p. ball-bearing motor, is equipped with a rough wheel for grinding tools down rapidly to approximate angles and a finishing wheel. Drills are held and positioned in a fixture which is said to simplify the setting of angles.

A lip positioner, it is claimed, affords the accurate grinding of small drills, and a drill point gage is fur-



Swanson 3-in-1 Tool and Drill Grinder

nished for quickly checking the chisel point, clearance, and point angles. Available for bench or pedestal mounting, the grinder is supplied with a tool bit fixture to permit the accurate grinding of angles on small lathe tools.

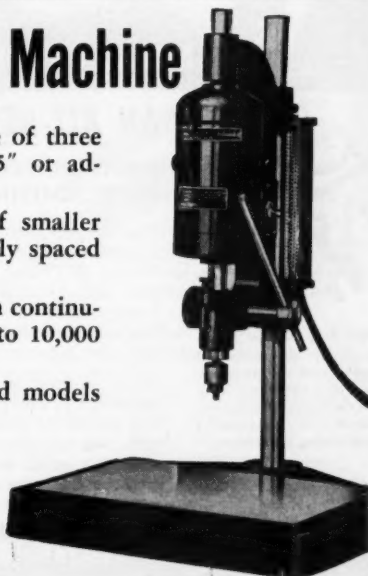
## 8" Precision Drilling Machine

- Super accurate chucking with choice of three types giving runout of .001", .0005" or adjustable to absolute concentricity.
- Minimum side play through use of smaller precision spindle bearings and widely spaced quill bushings.
- The exact speed for best drilling with continuously variable speed control: 1000 to 10,000 RPM or 2500 to 15,000 RPM.
- Special slow quill feed on dual feed models for drilling below No. 60.
- Minimum vibration-direct motor drive—no belts.

**The ELECTRO-MECHANO Co.**

265 E. ERIE ST.

MILWAUKEE, WIS.



## Drilling and Tapping Machine Is Available in Four Types

Designated as the Model B, a vertical-motor cone-pulley drive drilling and tapping machine which is available in four types to meet the needs of practically every production shop or toolroom has been announced by Edlund Machinery Co., Cortland 26, N. Y. Types available are 1B in 7 and 12-inch overhang, 2B in 8-inch overhang, 3B in 12 and 15-inch overhang, and 4B

in 12 and 16-inch overhang. The 1B has three speed ranges—low of from 500 to 1,540 r.p.m. and high of from 995 to 2,080 r.p.m., with an intermediate range. The 2B and 3B have four spindle speed ranges from a low of from 240 to 1,000 r.p.m. to a high of from 565 to 2,380 r.p.m., with two intermediate ranges. The 4B machine also has four ranges from a low of from 80 to 1,002 r.p.m. to a high of from 161 to 2,004 r.p.m., with two intermediate ranges.

Drilling capacities are  $\frac{5}{8}$  inch for the 1B machine,  $1\frac{1}{4}$  inches for the 2B and 3B machines, and  $1\frac{1}{2}$



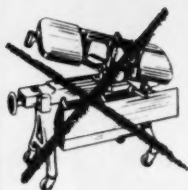
**Kalamazoo**

**MODEL 8C**

CUTS 8-INCH ROUND, 16-INCH FLAT, 8-INCH PIPE

**METAL CUTTING BAND SAW**

Constant equipment shown is available in extra unit



Model 8C's smooth, clean-cut design eliminates the multitude of clothes-catching, dirt-catching and knuckle-barking projections common to conventional metal cutting band saws.

## AN ALL-NEW DESIGN . . .

### FIRST TO MEET TODAY'S METAL CUTTING NEEDS!

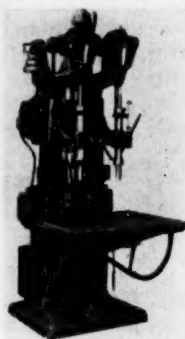
You'll get performance never before available when you get the ALL-NEW Model 8C band saw. Designed to meet your metal cutting needs today—and for a long time to come—Model 8C embodies years of Kalamazoo experience in the field and the best industrial design talent.

Once you've seen the new 8C, you'll agree it has everything you've been looking for in an 8-inch metal cutting band saw. Ask your dealer for a demonstration soon—or write today for descriptive literature and the name of your dealer.

MACHINE TOOL DIVISION

**Kalamazoo TANK and SILO CO.**

110 HARRISON ST., KALAMAZOO, MICHIGAN



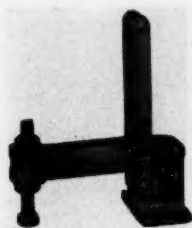
Edlund Model B Drilling and Tapping Machine

inches for the 4B machine. The 1B is available in 1 to 6 spindle combinations, the 2B and 3B in 1 to 8 spindle combinations, and the 4B in 1 to 4 spindle combinations. The 4B machine with single

or multiple spindles can be supplied in both pedestal and bench types. Other types with single or multiple spindles include pedestal-type machines with single spindle or a round column base.

### Midget Size Clamp Has 100-Lb. Clamping Force

Similar in design and performance to its larger counterpart models in the Knu-Vise line, a midget sized clamp which is available in two models has been announced by Lapeer Mfg. Co., 3048 Davidson Rd., Lapeer,



Knu-Vise Model V-100  
Midget Size Clamp

Mich. The Model V-100, with a vertical handle and horizontal mounting surface, has a clamping force of 100 lb. with the spindle located at the end of the toggle bar. The Model S-100 is for side mounting and also has a clamping force of 100 lb. when the spindle is at the end of the toggle bar.

### Concave Fastener

Designated as the "P-Nut," a spring-steel concave fastener with cut threads and self-locking corners has been announced by P-Nut Division of Waterbury Pressed Metal Co., 313 Chase Ave., Waterbury, Conn. According to the manufacturer, the nut is available in two sizes, Nos. 6-32 and 8-32, and eliminates the need of lock washers and special assembly tools.

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Abrasive  
Requirements**

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★ Star Dust ★  
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formula.



**STAR DUST  
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**STAR DUST Laboratory  
graded diamond lapping  
compounds in 18 gram  
applicator gun—or in 5 gram  
ophthalmic tipped tube.**

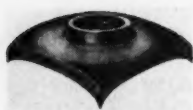
You can put your confidence in the STAR DUST line as so many others do because STAR DUST quality is consistent quality—the result of our special process of laboratory crushing and grading to achieve uniform nodular shape. That means *all* particles work for you. Be "Laps Ahead." For easier grinding and mirror finishes specify STAR DUST products.

For complete information and catalog write Dept. B-12.

**ACE ABRASIVE LABORATORIES**

**NEW ADDRESS: 35 ROSELLE STREET, MINEOLA, N. Y.**





"P-Nut" Spring-Steel  
Concave Fastener

The fastener can be used to fasten parts of assemblies that may be taken apart, as well as those not intended to be dismantled. For fastening parts of assemblies that can be taken apart, the nut is deflected so that bolt threads are distorted.

## Cam Clamp Holds Varying Stock Thicknesses without Adjustment

Designated as the "Sesco," a quick-acting fixture cam clamp which is said to maintain positive holding pressure and secure clamping action, even on such varying stock thicknesses as are found in castings and forgings, has been announced by Special Engineering Service, Inc., 8161 Livernois Ave., Detroit 4, Mich. According to the

manufacturer, the cam surface of the clamp makes allowance automatically for stock



## GUARANTEED ACCURACY! REPLACE WITH RED-E and be SURE!

RED-E offers the advantage of over 45 years of design, engineering and manufacturing experience. Only RED-E can serve your every Center requirement — regardless of size, taper, shank, style — and still GUARANTEE ACCURACY. Let us recommend a Center to fit your need.

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**RED-E TOOL COMPANY**

540 Iranistan Ave.  
Bridgeport 5, Conn.



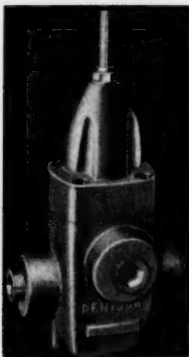
"Sesco" Quick-Acting  
Fixture Cam  
Clamp

thicknesses varying as much as  $\frac{1}{8}$  inch. The clamp is of rugged all-steel construction with all working surfaces machined to close tolerances and hardened. The heavy construction and precision assembly, along with the cam feature, is claimed to allow the clamp to withstand severe vibration.



## Direct-Operating Sequence Valve

A direct-operating sequence valve which is said to provide precision control for interlocked hydraulic operations, ensuring close synchronization of primary and secondary operations, has been announced by The Denison Engineering Co., 1153 Dublin Rd., Columbus 16, Ohio. When system pressure reaches the pressure setting of the valve, the valve diverts oil to the secondary circuit. Pressure build-up in the system brings immediate action of the pilot piston in the secondary circuit, which may be adjusted



Denison Direct-Operating Sequence Valve

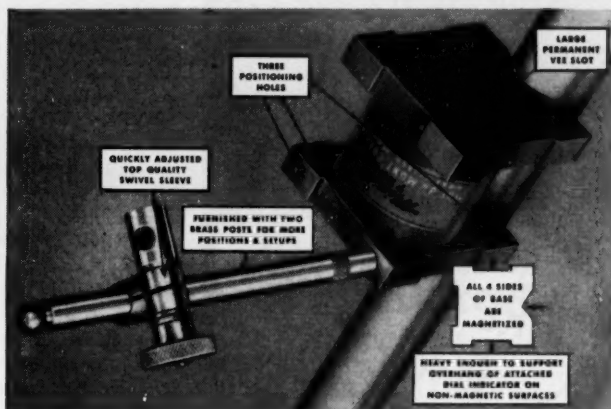
to shift at any pressure from 25 to 2,000 p.s.i. According to the manufacturer, the response is positive and control is close. The secondary operation begins immediately when the pressure reaches the presetting of the valve.

The valve is available in a threaded body style in  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and  $1\frac{1}{4}$ -inch sizes; in a subplate type in  $\frac{3}{4}$  and  $1\frac{1}{4}$ -inch sizes; and with a flange body in a  $1\frac{1}{2}$ -inch size. Pressure ranges are 25 to 125 p.s.i., 75 to 250 p.s.i., 125 to 500 p.s.i., 250 to 1,000 p.s.i., and 1,000 to 2,000 p.s.i. Half-inch sizes have a 15 g.p.m. capacity,  $\frac{3}{4}$ -inch sizes have a 20 g.p.m. capacity,  $1\frac{1}{4}$ -inch sizes have a 65 g.p.m. capacity, and  $1\frac{1}{2}$ -inch sizes have an 80 g.p.m. capacity.

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with this *Minute Man*<sup>®</sup>

### MAGNETIC BASE for Dial Indicators



for instant gage application just where you want it for quick, accurate readings. The *only* base with the

six practical, working advantages pictured. Pays for itself almost every time you use it.

**The du MONT CORPORATION, Greenfield, Mass.**

Please mail me Folder S describing multiple uses for Minute Man Magnetic Base

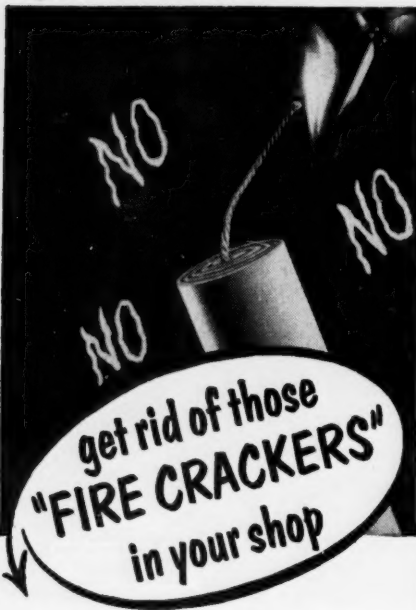
Name.....

Company.....

Address.....

## Automatic Loader for Single-Ram Broaching Machines

Marketed under the name "Red Ring," an automatic loader for single-ram vertical surface broaching machines has been announced by National Broach & Machine Co., 5600 St. Jean, Detroit 13, Mich. The loader is said to be particularly adapted to the handling of round parts on which flats, slots, or ends are broached in single-ram machines. The loader in-

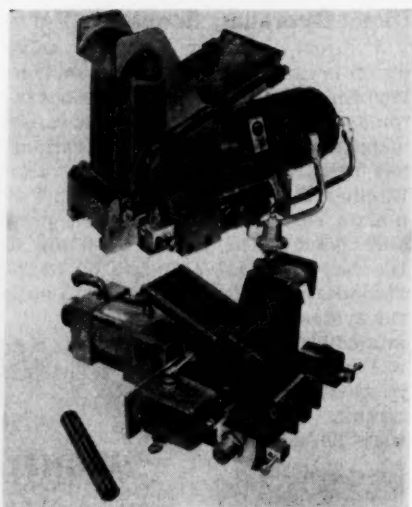


What fire crackers? We mean those welding and cutting torches that keep popping—back-firing—burning out valve seats. Did you know that the ingenious new Smith "FLO-TROL" prevents reverse flow of acetylene—protects torch against backfire and burned out seats?

Write us a card . . . NOW!

**SMITH WELDING EQUIPMENT CORPORATION**

Dept. MMS-81, 2633 S.E. 4th St., Minneapolis, Minn.



"Red Ring" Automatic Loaders

corporates a magazine feed arrangement which operates in conjunction with a hydraulic cylinder powered load and unload mechanism. The 1,000-p.s.i. hydraulic-control cylinder is flange mounted at the rear of the loader and is operated by an air booster. A standard air line source, it is claimed, will operate the boosters.

The Red Ring Automatic Loader is available in a variety of sizes to meet specific application requirements and is designed to operate in conjunction with individually-designed broach holders.

<b>EISLER CAM MILLING</b>	
<b>JIG BORING</b>	<b>A SPECIALIZED CAM MILLING SERVICE...</b>
	<b>JIG BORING... SPOT WELDING... CONTRACT PRODUCTION</b>
<b>... EXPERIMENTAL DEVELOPMENT</b>	
<b>EISLER ENGINEERING CO., Inc.</b>	
734 So. 13th St. Newark 3, N. J.	

## Portable Elevating Table Simplifies Heavy Bar Stock Handling

Product of The Hamilton Tool Co., 828 S. Ninth St., Hamilton, Ohio, the Portelvator shown herewith is designed for handling and positioning heavy bar stock. It can be used to receive the heavy billets at the receiving dock and transport them to the stockroom for storing until needed. As billets are required, the Portelvator may be employed to move them from the stockroom to the sawing machine where the material is height positioned and fed directly from the Portelvator to the saw.

Slots between rollers No. 1 and 2 and rollers No. 3 and 4 are said to enable the chain of an overhead crane to be wrapped around the billets securely. The table has a capacity of 2,000 lb. and has a vertical travel of 14 inches. Minimum height from the floor is 20 inches, and maximum height



Hamilton Portelvator

from the floor is 34 inches. The table is elevated by a hand crank from the side to permit the extension of the bar stock over each end. The table surface measures 18x20 inches.

## CHECK, MEASURE, INSPECT with this HANDY POCKET COMPARATOR

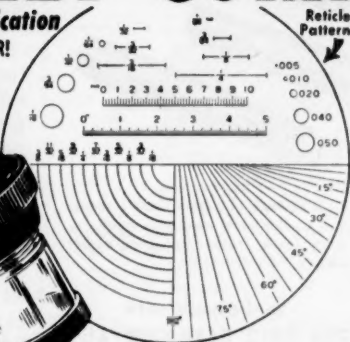
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in both decimal  
inches and mms.



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**and ACCURATE**

On Small Parts ...

**Small Dimensions**

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Ask for Free Catalog #AN.

**EDMUND SCIENTIFIC CORP., Barrington, N. J.**

## Fly Cutter Features Micrometer Screw Adjustment

For power tool use with such machines as electric drills and drill presses, Mico Instrument Co., 73 Trowbridge St., Cambridge 38, Mass., has announced the Mico No. 805 Micrometer-Type Fly Cutter which is constructed entirely of steel with a  $\frac{1}{2}$ -inch diameter shank and which uses a  $\frac{1}{8}$ -inch diameter high-speed steel cutting bit.

A unique micrometer screw adjustment provides the tool with a cutting range of from  $1\frac{1}{8}$  to  $7\frac{1}{2}$ -inch diameter. Radius adjustments may be made by means of a graduated dial, without removing the tool from the supporting chuck, and all adjustments are locked securely by means of recessed socket-head set screws.

The tool is said to be capable of cutting holes in steel, aluminum, brass, wood, hard rubber, plastics, and fiber

up to thicknesses of  $\frac{1}{2}$  inch, with or without a pilot, and can also be used without a pilot as a facing



Towmotor's "one man gang" is designed to "take it" and the many factors that go into manufacturing a lift truck must be equally as rugged to withstand a lift truck's round-the-clock grind.

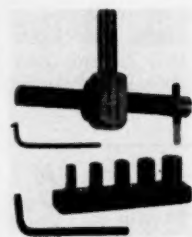
Towmotor units operate the world over—loading ships—lifting steel coils and bars to trucks or stacking lumber, stone and finished products. Do you know of a greater test for gears?

Towmotor depends on Ohio Gears to insure their products' operation and reputation at home and abroad.

Towmotor is another good reason why more automotive designers are specifying Ohio Gears. Perhaps Ohio Gear can do as much for your product. See their nearest distributor or write direct.

Pictured here are Ohio Gear's power transmission units used in Towmotor's, 2-ton load, Diesel powered model 480-PD Fork Lift Truck.

ESTABLISHED 1915  
**THE OHIO GEAR COMPANY**  
1308 EAST 179th STREET • CLEVELAND 10, OHIO



Mico No. 805 Micrometer-Type Fly Cutter and Special Pilot Set

tool for surface milling operations. Where pilot holes are provided in the work-piece, the tool may be equipped with a special pilot, of the required diameter which is screwed into position and locked with a socket-head set screw. Pilots, it is claimed, may be changed without removing the tool

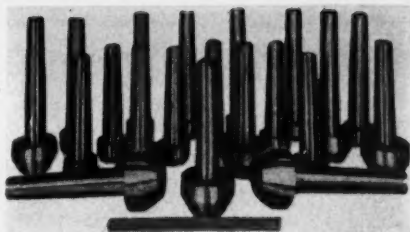
from the chuck or disturbing the setting of the cutter. A special set of five pilots having diameters of  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{7}{16}$ , and  $\frac{1}{2}$  inch can be supplied as extra equipment.

### Solid Bull Nose Center Is Available in High Speed Steel and Carbide-Tipped Types

Ready Tool Co., 540 Iranistan Ave., Bridgeport 5, Conn., has announced a

solid bull nose center which is available in either high speed steel or carbide-tipped types in the most unusual bull and pipe type sizes and shapes. The high speed steel type center is hardened to ensure resistance to abrasive wear, and the tungsten carbide tipped type center is made of special high grade cemented carbide to provide for maximum wear resistance.

Said to be ideal for the aircraft industry for precision grinding or for pieces with large openings, the Red-E Solid Bull Nose Center can be supplied in various standard types and sizes. Special sizes of the center can be furnished to user specifications if desired.



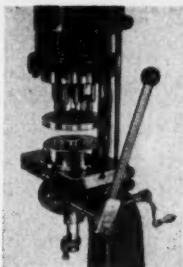
"Red-E" Solid Bull Nose Centers

*Production with  
Accuracy at Low Cost!*

**STEINEL**

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Drill stroke . . .  $1\frac{1}{4}$ "  
Spindle speeds . . . 2800 RPM  
Max. drilling dia. . .  $4\frac{1}{8}$ "  
Motor . . .  $\frac{3}{4}$  H.P.



#### Multi-Spindle Drilling & Tapping Machine

Model BS 105  
with fixed  
drilling spindles



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Min. dia. of work . . . . .	.019"	.039"
Max. dia. of work . . . . .	.078"	.314"
Max. length of work . . . . .	5.11"	6.29"
Speeds: SR 2—(6) 530/3000 RPM, SR 3—(10) 325/2520 RPM		

#### Pivot Burnishing Machines

Models SR 2  
and SR 3

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**MOREY**

*for machine tools!*

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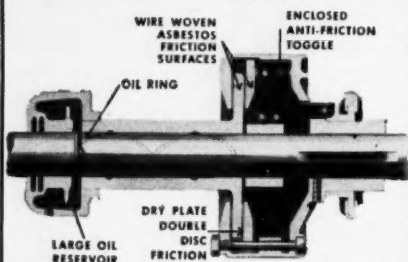
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**BROWN MULE PULL CLUTCHES**

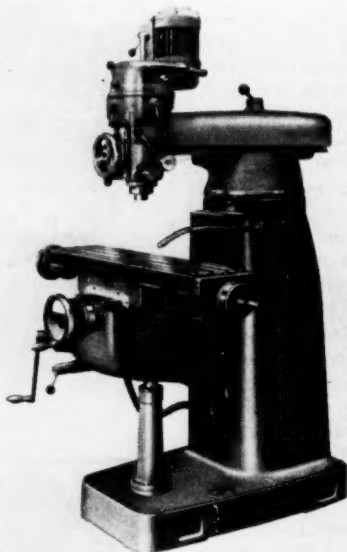
## BARKER Bench Type MILL



500 Green Road, Cleveland 21, Ohio

## Turret-Type Milling Machine Features Back-Geared Head

Graham Machine Tool Co., 19 Cleveland Place, New York 12, N. Y., has announced the Pearson Model H Turret-Type Milling Machine which features a high-speed motorized back-geared vertical head with power feed spindle. The machine has a 5½-inch automatic spindle travel, and spindle speeds up to 4,100 r.p.m. are said to



Pearson Model H Turret-Type Milling Machine

be provided through a 1.2-h.p. motor. Designed with an extra-heavy frame, knee, turret, and ram, the machine, it is claimed, can be used for high precision jig boring to 0.0001 inch, tool and die work, and certain types of production work.

According to the manufacturer, extra large dials provide quick and accurate table settings, and power feed for the table is available as optional equipment. The machine weighs approximately 2,300 pounds.

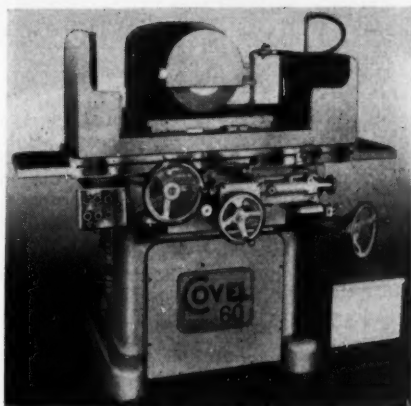


## Surface Grinder Has Wide Cross Feed

Designated as the Model No. 60, a 15 x 24-inch precision surface grinder having a 15-inch width of cross feed has been announced by Covell Mfg. Co., Benton Harbor, Mich. The machine features a 14 x 24-inch work surface, 27-inch table travel, and vertical work capacity of more than 18 inches. Ruggedly constructed to allow for heavy cuts, the grinder has a table speed ranging from 10 to 90 feet per minute.

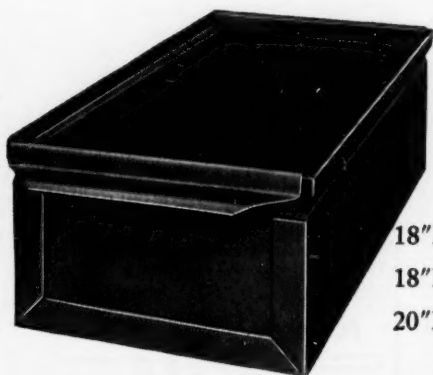
Other features include conveniently located elevating handwheel below the table level, built-in wheel truing device, closed hydraulic circuit, complete dust protection, powered elevation, and automatic lubrication of working parts.

According to the manufacturer, the machine is ideal for grinding trim and mold dies, plastic molding and form-



Covell Model No. 60 Precision Surface Grinder

ing dies, form and cut-off tools, and can also be quickly and easily adapted to a variety of other toolroom and production jobs.



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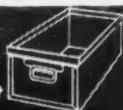
If above sizes do not fit your product, write for price on size you use.

Sterling Factory Equipment Co., 183 Charles St., Providence, R. I.



# Sterling

Quality Handling & Storage Equipment



## NEW SHOP LITERATURE

"Landis Men and Machines" is the title of an interesting and attractively printed booklet issued by Landis Machine Company, Waynesboro, Pennsylvania, in commemoration of its 50th anniversary. Available to mechanical executives, the booklet deals with the development and growth of this leading thread generating equipment manufacturing firm since its inception in 1903.

**Standard Carbide Cutting Tools.** Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich., has issued a 92-page two-color catalog (No. 54) which describes and illustrates its line of standard carbide cutting tools. Sections of the catalog are devoted to standard carbide-tipped milling cutters, end mills, reamers, drills, and single point tools, as well as solid carbide tools, ejector tools, and special carbide tools. A shadow index has been provided for quickly locating any category, and line drawings and specifications are included.

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**Boring Bars.** DeVlieg Microbore Co., 480 Fair Ave., Ferndale, Detroit 20, Mich., has issued a comprehensive catalog describing and illustrating the "Microbore," a multipurpose single-point adjustable tool for precision boring, turning, and facing operations. Information on standard boring bar sets for jig boring machines and turret lathes is also included.

**Radial Drills and Vertical Milling Machines.** Masters Machinery Supply Co., 3613 Archer Ave., Chicago 9, Ill., has issued a catalog describing Arboga Radial Drills which are available in three sizes up to 43 inches and Arboga Vertical Milling Machines which are powered by heavy-duty direct-gear drive heads for handling end mills up to 1 inch.

**Screw Driving Machines.** An 18-page bulletin which describes and illustrates its complete line of magazine-feed power-driven screw driving machines has been released by Cook & Chick Co., 638 S. Miller St., Chicago 7, Ill. Complete specifications and data on part feeders are included.

**Sprayed Molybdenum.** A four-page illustrated bulletin (No. 57C) published by Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y., fully describes the use of Sprabond Wire, essentially pure molybdenum in a form suitable for metallizing use. Data on several applications are included and line drawings are provided.

**Honing Machines and Tools.** An eight-page two-color bulletin (No. 500E) issued by Barnes Drill Co., 860 Chestnut St., Rockford, Ill., describes and illustrates its line of Barnesdril honing machines, honing tools, and honing stones for production finishing of cylindrical surfaces. Line drawings are included.

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DRILLS**

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Special Lengths and Types. Prompt Delivery.  
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**HI-DUTY DRILL WORKS**  
FLEETWOOD, PA.

**"Facts About Silicon Carbide,"** a 52-page booklet released by The Carborundum Co., Niagara Falls, N. Y., discloses the properties of silicon carbide as related to a wide variety of applications and outlines manufacturing techniques. The booklet includes information on silicon carbide, such as discovery and occurrence, formation, properties, grain preparation, and so on. An extensive bibliography is also provided.

**Shell Trimming Equipment.** An eight-page two-color bulletin (No. 25-B) released by Dayton Rogers Mfg. Co., Minneapolis 7, Minn., fully describes and illustrates its drawn shell trimmer which is especially designed to trim rectangular or square shells with small corner radii. Dimensional drawings and specifications are provided.

**High-Speed Tapping Heads.** A two-color illustrated brochure released by Proconier Safety Chuck Co., Export Dept., 38 S. Dearborn St., Chicago 3, Ill., fully describes and illustrates its complete line of high-speed tapping heads, as well as the "Tap King" Heavy-Duty Tapping Attachment and the "Tru-Grip" Tap Holder. Cross-section diagrams and parts charts are included in the brochure.

**Milling Attachments.** The Cincinnati Milling Machine Co., Cincinnati 9, Ohio, has released two two-color publications (No. M-1766 and No. M-1816) describing and illustrating its heavy-duty vertical milling attachment and its heavy-duty universal spiral milling attachment, respectively. Dimensional drawings and specifications are included.

**End Wheel Presses.** An eight-page two-color catalog (No. 4-A) issued by E. W. Bliss Co., Canton, Ohio, fully describes and illustrates its end wheel presses of all types. Specifications for standard, medium, and deep-throat presses of fixed bed and adjustable bed designs are included.

**"The Case of the Ailing Weldollar"** is the title of a 12-page two-color booklet, issued by The Lincoln Electric Co., Cleveland 17, Ohio, which presents an analysis of the basic causes of high costs and suggests a plan for reducing these costs. The booklet, with clear graphic explanations, shows how the cure for the high cost of welding, caused by labor and overhead, can be achieved.

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STORY!**



Send for Woody Spencer's Handy Tapping Guide . . . all arranged for quick, easy tapping reference. IT'S FREE! Hangs on wall or lies flat on desk.

*The Wood & Spencer Company*

**Precision Measuring Instruments.** The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill., has released a 36-page illustrated catalog which provides full details on the Tumico line of precision measuring instruments, including micrometers, dial indicators, height gages, comparators, and depth gages.

**Hand Electric Power Lift Trucks.** Lift Trucks, Inc., 2429 Spring Grove Ave., Cincinnati 14, Ohio, has released a catalog (No. 35) which describes the latest improvements and illustrates various features, sizes, and models of its single-stroke, multi-stroke, and hand electric power lift trucks.

**Gear Deburring and Chamfering Machine.** A four-page two-color bulletin (No. 103-60) released by Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 4, Mich., describes and illustrates its Universal Burr-Masters which are said to be capable of chamfering the entire tooth form of both spur and helical gears, as well as external straight and involute form splines. Information on features is included.

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**Cut-Off Wheels.** A 36-page two-color revised instructive manual released by Norton Co., Worcester 6, Mass., provides information on various types of cutting-off machines and abrasive cut-off wheels, their selection, application, and proper usage. The manual also contains illustrations of typical cutting-off operations, and various helpful tables for wheel selection and conversion of wheel speeds to feet per minute values are included.

**Air-Operated Clamps, Cylinders, Valves, Feeds, and Hammers.** A six-page two-color folder issued by Mead Specialties Co., 4114 N. Knox Ave., Dept. AA-103, Chicago 41, Ill., describes and illustrates its line of midjet air clamps, air cylinders, air-operated rotary work feeders, drill press feeds, impact hammers, air presses, and air valves. Specifications are included.

**Automatic Tracer - Controlled Milling Machine.** A 12-page two-color bulletin (No. 565) released by Pratt & Whitney, Division Niles - Bement - Pond Co., 25 Charter Oak Blvd., West Hartford 1, Conn., fully describes and illustrates its Type BG-21 Keller Machine which is built specifically for automatic tracer-controlled milling operations. Data on features, line drawings, and specifications are included.

**Machine Tool Attachments and Accessories.** South Bend Lathe Works, South Bend 22, Ind., has issued a two-color bulletin (No. 5321C) which offers a bird's-eye view of the job range now possible with its lathes, drill presses, and shapers. A complete line of attachments and accessories is described and illustrated, and prices and specifications are included.

**Electronic Controls.** An eight-page two-color catalog (No. F 6166) released by Barber-Colman Co., 9510 Rock St., Rockford, Ill., describes and illustrates its electronic controls for heating, ventilating, and air conditioning. Application information, specifications, and line drawings are included.

**Centerless Lapping Machine.** Size Control Co., 2500 W. Washington Blvd., Chicago 12, Ill., has released a four-page four-color bulletin (No. L-53) describing and illustrating its centerless lapping machine which produces finishes of less than 1 microinch r.m.s. Operating instructions for the lapping machine are included.

**Pressure Plugs.** A four-page two-color bulletin prepared by Standard Pressed Steel Co., Box 556, Jenkintown, Pa., describes and illustrates its Unbrako Dry-seal-Thread Pressure Plugs which provide a positive seal against either liquids or gases under pressure. The bulletin describes the sealing operation of the threads, and line drawings and specifications are included.

**Screw Products.** A 16-page two-color engineering folder issued by Strong, Carlisle & Hammond Co., 1392 W. Third St., Cleveland 13, Ohio, which describes and illustrates its line of "Mac-it" Screw Products that are precision-made from alloy steel with each type of screw heat treated specifically to fit its individual application. Line drawings are included.

**Carbide Tools.** A 24-page two-color catalog issued by Chicago-Latrobe, 411 W. Ontario St., Chicago 10, Ill., describes and illustrates its "Double Circle" line of carbide drills, reamers, masonry drills, glass drills, shell reamers, lathe centers, countersinks, gun drills, special tools, and tool bits. Engineering information, a carbide grades chart, and specifications are included.

**Solenoid Pilot Operated Control Valve.** An eight-page three-color bulletin (No. SK-53) issued by Valvair Corp., 454 Morgan Ave., Akron 11, Ohio, fully describes and illustrates its "Speed King" Solenoid Pilot Operated Control Valve. Information on features, complete specifications, and dimensional drawings are included.

**Permanent Magnets.** Latest information on the uses, design, properties, and manufacture of Alnico permanent magnets, sintered grade 5, is contained in a six-page technical report (PM-111) released by Carbonyl Department of General Electric Co., 11143 E. 8 Mile St., Detroit 32, Mich. The report includes charts, graphs, and photomicrographs for explaining the magnetic and physical characteristics of the magnets.

**Belt Grinding and Finishing.** A 12-page two-color brochure released by Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn., describes and illustrates the 3M method, using coated abrasive belts, as a high speed means of grinding and finishing flat or contoured surfaces of all kinds of metal, ranging from soft brass to hard tungsten carbide. Typical case histories are included.

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**Engraving Machine.** Green Instrument Co., Inc., 385 Putnam Ave., Cambridge 39, Mass., has issued a six-page two-color folder describing and illustrating its Model 106 Engraver which is said to cut five different sizes from each master pattern. Information on various features, as well as a parts and accessory price list, is included.

**Drilling and Tapping Machines.** An eight-page two-color bulletin (No. 130) issued by Edlund Machinery Co., Dept. 26, Cortland, N. Y., fully describes and illustrates its Model 2B, 3B, and 4B Vertical-Motor Cone-Pulley Drilling and Tapping Machines which are designed for fast, efficient production. Information on construction features, data on various attachments, and specifications are included.

**Dew Point Controller.** Ipsen Industries, Inc., 715 S. Main St., Rockford, Ill., has issued a two-color illustrated bulletin (No. C-21) describing its dew point controller which, it is claimed, automatically indicates, records, and controls dew point in controlled atmosphere heat-treating furnaces. A line drawing and specifications are included.



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**Jig and Fixture Components.** Jergens Tool Specialty Co., 712 E. 163rd St., Cleveland, Ohio, has issued a two-color illustrated folder describing its greatly expanded line of jig and fixture components, including blank jaws, sine fixture keys, malleable handles, T-slot nuts and bolts, shoulder and thumbscrews, handwheels, rest buttons, quarter-turn screws, studs, strap clamp assemblies, flange nuts, swing C-washers, plastic balls, hand knobs, clamping levers, and fixture keys.

**Lubrication for Cold Extrusion of Steel.** An eight-page two-color bulletin released by Detrex Corp., Box 501, Detroit 32, Mich., describes the Extrudite Process, involving the use of two specially-developed compounds, which chemically interlocks lubricant with the work surface for making cold extrusions of steel. A wide variety of extruded parts is illustrated, and information on the steps in applying the process is included.

**Center Tips.** A two-color illustrated bulletin (No. CT-10) describing Colmonoy lathe and grinding machine center tips and tips for centerless grinder blades has been released by Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich. The bulletin lists specifications and prices for 48 sizes of lathe and grinder center tips and for nine sizes of 30-degree face angle centerless grinder blades.

**Single-Spindle Automatics.** An eight-page two-color bulletin issued by The Cleveland Automatic Machine Co., Cincinnati 12, Ohio, describes and illustrates its Cleveland "Dialmatic" 4¼ and 5¼-Inch Model AB and Cleveland 4¼-Inch Model AW Single-Spindle Automatics. Information on features, a dimensional drawing, and specifications are included.

**Magnetic Chucks.** A 16-page two-color catalog (No. 411) published by The Taftpeirce Mfg. Co., Woonsocket, R. I., fully describes and illustrates "Superpower" Magnetic Chucks and accessories. Information on features, data on applications, specifications, and prices are included.

**Power Transmission Equipment.** An eight-page two-color bulletin released by Lovejoy Flexible Coupling Co., 5007 W. Lake St., Chicago 44, Ill., describes and illustrates its line of flexible couplings, variable speed pulleys and transmissions, and universal joints. Line drawings and specifications are provided.



**Hardening Stainless Steel.** C. U. Scott & Son, Inc., Rock Island, Ill., has published an illustrated 64-page booklet describing a hardening process, designated as Super Scottsonizing, which is a method of hardening precision stainless steel parts, that will be subjected to excessive wear, whereby the size will vary less than  $\frac{1}{4}$  of 1/10,000 of an inch.

**Flexible Shafting.** A 16-page three-color design manual (No. 528) issued by Stow Mfg. Co., Binghamton, N. Y., is intended to serve as a guide in the design, selection, and installation of flexible shafting for remote control of valves and all types of equipment actuated by rotating shafts. Numerous line drawings and complete specifications are provided.

**Heavy-Duty Air and Hydraulic Cylinders.** Air and Hydraulic Division of Lindberg Engineering Co., 225 N. Laflin St., Chicago 7, Ill., has released a bulletin (No. 800) describing its standard line of heavy-duty air and hydraulic cylinders. Descriptions of large, custom-built cylinders, as well as features of each type cylinder, are included.

**Cylindrical Correction Chart for Rounds.** Wilson Mechanical Instrument Division, American Chain & Cable Co., Inc., 230-G Park Ave., New York, N. Y., has published a three-color pocket-size celluloid cylindrical correction chart for rounds. The chart indicates corrections to be added to hardness values obtained on cylindrical surfaces when a comparison between the cylindrical hardness value and the hardness value of the same material tested flat is needed. According to the manufacturer, the corrections are approximate but satisfactory for practical purposes.

**Die Accessories.** The Producto Machine Co., 910 Housatonic Ave., Bridgeport 1, Conn., has issued three supplements to its No. 10 Producto Die Set Catalog and the Producto Accessories Catalog. A four-page supplement has been added, covering revised prices for its line of die-makers springs. These prices, which became effective September 1, 1953, supersede all previous pricing data on this product. Another four-page price supplement, covering set screws and stripper bolts, has also been added to the Producto No. 10 Catalog. A one-page insert for the catalog describes and illustrates a new line of medium pressure diemakers' springs which are of the 50 per cent deflection, oval wire type.

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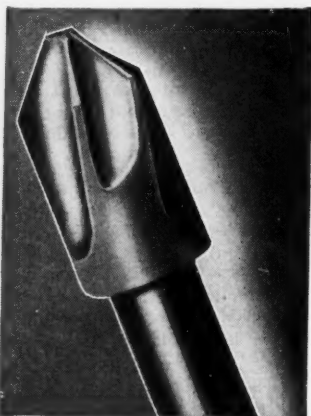


**Face Milling Cutters and Shell End Mills.** The Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio, has issued an eight-page two-color bulletin (No. 101-CT) describing and illustrating the "Kroslok" Face Milling Cutters and Shell End Mills. Complete specifications and dimensional drawings are provided.

**General-Purpose Precision Lathe.** Hendey Machine Co., Inc., Torrington, Conn., has issued a two-color specification sheet covering its No. 2E 14-Inch General-Purpose Precision Lathe with electronic control of infinitely variable spindle speeds ranging from 15 to 1,500 r.p.m. Information on various features is included.

**Shears.** Faster and easier ways of selecting, setting up, and operating Di-Acro Shears are described and illustrated in a 14-page booklet released by O'Neil-Irwin Mfg. Co., 576 Eighth Ave., Lake City, Minn. The booklet points out the many different materials that can be sheared, and specifications and capacities are listed in easy-to-read table form on four hand and four power-operated precision shears which have a material capacity of 16-gauge mild sheet steel.

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Six staggered cutting edges give shearing cut that eliminates all chatter.  
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**Shop Tools.** A two-color pocket-size folder cataloging its line of shop tools has been published by The Billings & Spencer Co., Hartford 10, Conn. Shop tools listed and illustrated in the folder include C-clamps, strap clamps, machinists' clamps, chain pipe vises, hoist hooks, crank handles, ball peen hammers, screwdrivers, eye bolts, and eye nuts. Pertinent data on sizes, capacities, and so on, are included.

**Hitch Feed.** A two-color illustrated bulletin released by H. E. Dickerman Mfg. Co., 322 Albany St. Springfield, Mass., fully describes its 2½-Inch Model K Hitch Feed which can be attached to any press, mechanical or hydraulic, and may be mounted on a die set or bolster plate. Specifications are included.

**Press Brake Dies, Punching Attachments, and Press Brakes.** Verson Allsteel Press Co., 9310 S. Kenwood Ave., Chicago 19, Ill., has released a 112-page die manual which is devoted to a pictorial presentation of Verson press brake dies and special tooling, along with detailed text and tables on how to select dies for specific jobs, tonnages required, and so on. Bound in spiral plastic, the manual also includes useful engineering data.

**Chart for Adjusting Shim-Type Clutches.** A 3x2-foot service chart describing eight important steps for adjusting shim-type clutches has been released by Lipe-Rollway Corp., 712 Emerson Ave., Syracuse, N. Y. Five large illustrations supplement the detailed information on how to check dimension "A", block clutch pedals, tighten adjusting nuts firmly, and check clearance between clutch release sleeve and clutch release bearing. The chart has reinforced metal edges and brass ring hanger straps.

**Involute Gear Checker.** Details of the Model 1136 "Sine-Line" Involute Checker built to check involutes of gears up to 36-inch pitch diameter and with a maximum spread between centers of 26 inches are contained in a bulletin (No. 1136-53) released by Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. The bulletin explains how the Model 1136 combines size with versatility and can be used for checking the involute of spur and helical gears, tooth spacing of both types of gears, and the involute of internal gears. Also included in the bulletin are brief descriptions of how these various operations are performed.

**Machine Tool Lubrication and Cutting Fluids.** A 67-page shop notebook released by D. A. Stuart Oil Co., Ltd., 2741-47 S. Troy St., Chicago 23, Ill., contains information on machine tool lubrication; cutting fluids for high-speed screw machines, tapping and threading, gear cutting, and multiple-spindle automatic screw machines; water-mix fluids for grinding; and oils for broaching.

**Precision Lathe.** A 20-page illustrated bulletin (Form No. 502) released by The Monarch Machine Tool Co., Sidney, Ohio, fully describes and illustrates its 13-Inch Model EE Precision Lathe which is designed for toolroom and production turning operations. Information on features and accessories, as well as specifications, are included.

**"A Selection of 12 Typical Case Histories,"** the title of a brochure released by The Bodine Corp., Bridgeport, Conn., presents case histories covering the four standard sizes of Bodine machines, tooled for a variety of operations, including drilling, milling, tapping, screw inserting, and assembling. A description of the construction and operation of the basic Bodine machines is included.

**Taps.** Tap sizes, thread forms, and latest price information pertaining to Standard "Specific" Taps are contained in a 32-page two-color illustrated bulletin (No. ST-53) issued by Detroit Tap & Tool Co., 8615 E. 8 Mile Rd., Base Line, Mich. Brief descriptions in each section explain the characteristics of the tap that make it specially suitable to a particular material.

**Hand Miller.** A six-page two-color folder (No. 101) issued by Nichols-Morris Corp., 76-H Mamaroneck Ave., White Plains, N. Y., describes and illustrates the Nichols Miller which is designed for horizontal milling, vertical milling, keyseating, profiling, turning, boring, facing, and recessing operations. Data on applications and accessories, as well as specifications, are included.

**Hydraulic Presses.** A 12-page illustrated bulletin (No. 5004-A) issued by The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, briefly describes the complete H-P-M line of hydraulic presses for metalworking and process industries, die casting, and plastics molding. Information on applications and types and sizes of machines available is included.

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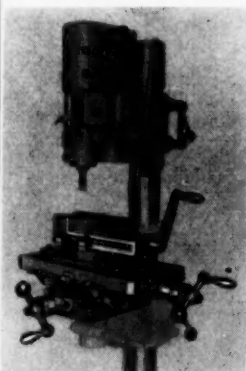


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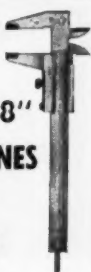
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**Expanding Mandrels and C-Clamps.** A four-page two-color folder released by Le Count Tool Works, Inc., 390-M Capitol Ave., Hartford, Conn., describes and illustrates its line of "Count-Centric" Expanding Mandrels and "Thor-aloy" Drop-Forged C-Clamps.

**Tube Expanding Machines.** A two-color catalog sheet describing and illustrating its line of vertical tube expanding machines which expand and size metal tubing by means of hydraulic-powered expansion mandrels has been issued by Walter P. Hill, Inc., 22183 Telegraph Rd., Detroit 19, Mich. General application data and an operating description, as well as complete specifications, are included.

**Air Gage.** A 24-page two-color catalog (No. 53B) released by Federal Products Corp., 1144 Eddy St., Providence 1, R. I., fully describes and illustrates the "Dimensionair" Air Gage. Data on features and applications, information on accessories, specifications, and line drawings are included.

**Coil Loading Hooks.** An eight-page two-color bulletin released by F. J. Littell Machine Co., 4163 N. Ravenswood Ave., Chicago 13, Ill., describes and illustrates its line of coil loading hooks for coils ranging from 1,000 to 40,000 lb. Specifications are provided.

**High Temperature Alloys.** Firth Sterling Inc., 3113 Forbes St., Pittsburgh 30, Pa., has released a four-page bulletin (No. 301) describing five grades of high temperature alloys. The five grades are Firth "Discaloy," Firth "16-25-6," Firth "A-286," Firth "19-9-DX," and Firth "Greek Asculoy."

### Correction

In the Super-Cut advertisement of the \$45.00 Single Layer Diamond Wheel which appeared in our December 1953 issue, the incorrect dimensions of the wheel appeared. The advertisement read 6" dia., 3/4" face. The correct dimensions should have been 6" dia., 1/4" face.



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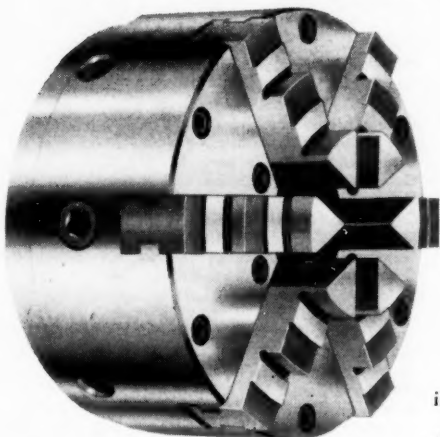
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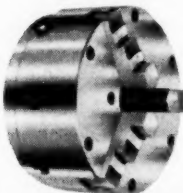
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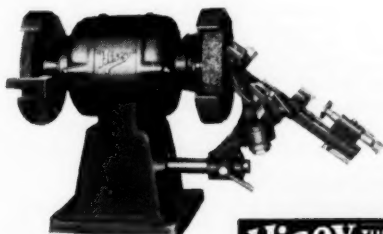
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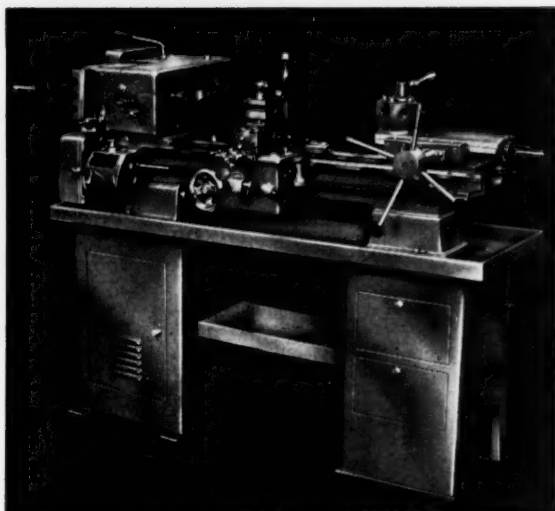
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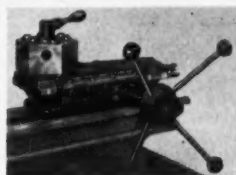
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different  
about this  
worker?**

**He's using the new Scott  
Industrial Wipers. He likes  
them better—so do people  
in management**



Scott Wipers are the result of years of testing and research. They're designed to meet your general industrial wiping needs—big or small.

Each Scott Wiper is safe and sanitary—double ply, strong and absorbent. They're disposable—throw them away when fully used. This means new standards of safety and user comfort. Their uniformity of size and performance now allow you to budget wiping just like any other production operation.



**SCOTT PAPER  
COMPANY**

A trial installation supervised by one of our technicians working with your people has been found to be the most accurate way to prove this product. If you would like information on such a trial period—and the full story on Scott Wipers—mail coupon below.

Scott Paper Company,  
Dept. MM-C, Chester, Pa.

Name

Address

Position

City  State

## GET EXTRA TAPPING CAPACITY AT LOW COST

- Fits the drill press spindle just like any other shank tool. No alterations necessary.
- Super-sensitive friction clutch provides full protection against tap breakage and work spoilage.
- Quill clamps are available for absolute rigidity.
- Made in 7 sizes for 0 to 1" taps.

For Full Details Write For Bulletin No. 22

### IT PAYS TO BUY THROUGH YOUR LOCAL ETTCO-EMRICK DISTRIBUTOR

He offers you . . .

1. Years of experience as a qualified specialist in selling tapping and drilling equipment.
2. A sales and service force ready to give you on-the-spot assistance at all times.
3. Ample stocks — quick deliveries — authoritative information on Ettco-Emrick equipment.
4. Expert advice in selecting the right equipment for your needs.
5. A personal interest in your problems—he knows that his success depends on your satisfaction.

Call him today — he's only as far as your telephone.



**Ettco-Emrick**  
**TAPPING  
ATTACHMENTS**



**ETTCO TOOL CO., INC.**

598 Johnson Ave., Brooklyn 37, N. Y.

DETROIT • CHICAGO • WORCESTER • SAN GABRIEL, CALIF. • Dealers throughout the United States and Canada

# HE has it...



## *the thing you want!*

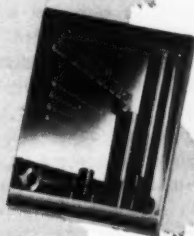
NO NEED to search through directories or ask people about it. When you need a finished bearing, a bar of bearing bronze or any other one of countless items of industrial materials and equipment, just phone your industrial distributor.

YOUR BUNTING distributor is the leading industrial distributor, or a stock-carrying specialist in certain industrial items. With money-saving convenience, he can supply hundreds of different sizes of completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars.

# Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

Ask him  
for a Bunting  
Catalog which gives  
complete dimensional  
and technical data.



The Bunting Brass & Bronze Company • Toledo 1, Ohio • Branches in Principal Cities • Distributors Everywhere



## the last word

### Consumers Plot Prosperity Curve

**T**HE University of Michigan Survey Research Center has recently completed another of its inquiries into consumer attitudes, which finds that many people consider this a good time to buy because they look for stable prices and also expect their family finances to be better during this year. A sizable portion of families think there will be some bad times in the next five years, but good times are expected for the next twelve months. These surveys, which have been a good gauge of sentiment in the past, cannot be turned into sales figures; but the findings should give encouragement.

It is of interest to inquire why people still seem relatively optimistic, despite published downturns in business indexes and the wide-spread expectations of moderate recession. Possibly the answer is that people know that their desires and buying inclinations are unimpaired. Manufacturers and business analysts may think in terms of saturated markets, but consumers seldom do. They know the truth of the statement that human wants are unlimited—a truth that obviously does not apply to every specific thing at every time, but that is indisputable when applied to desires in the aggregate at all times. Everyone knows it would be idle to suggest that even American living standards have reached their maximum or that expansion of American productive facilities will ever cease.

In last analysis, what is producing the expectations of business decline during 1954 is the concept of a "gap" as compared with 1953. The gap represents prospective reductions in demand for capital goods, automobiles and housing, and prospective cessation of inventory stocking. What this may amount to in dollar terms would be hard to predict, but in any event it can represent only a trifling percentage of the total potential production and markets of the country. The gap can be narrowed by success in developing new and better goods for the market, or by making old products at lower costs; and by flexibility in production planning and the use of resources to give people what they want. Needless to say, this effort requires the cooperation of industrial management and labor, directed toward the goal of reducing unit costs.

---

### Helpful Hint

**O**NE of the secrets, if it may be called such, of being able to do an unusual amount of work without weariness or harmful reaction is to find the element of pleasure that exists in every constructive activity. The best way to find such pleasure is to look beyond the immediate task and discover the ultimate purpose of the task.

# MORTON

## OFFERINGS FOR JET ENGINE PROGRAMS

● Morton 16" Stroke Heavy Duty Flash Trimmer, Hydraulically Driven. It is arranged for flat and circular work having 9" minimum lower horn. It has 2" of operating distance between the dies and capacity for removal of flash of various alloys up to 1/4" thick.

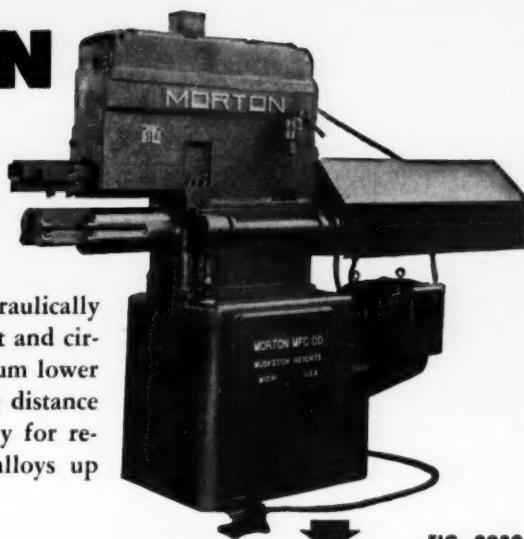
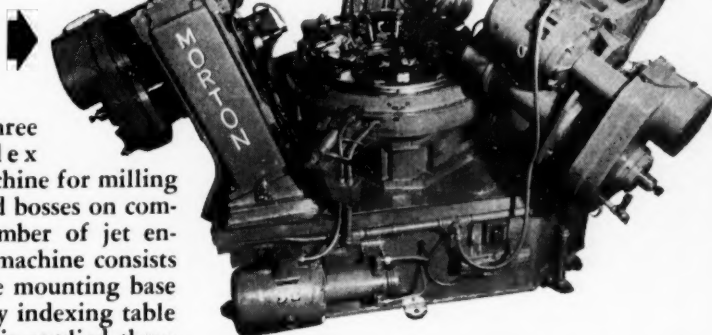


FIG. 2930  
BULLETIN NO. 35-0

FIG. 4082  
BULLETIN NO. 47-0



● Special Three Head Index Milling Machine for milling the pads and bosses on combustion chamber of jet engines. This machine consists of a suitable mounting base with a rotary indexing table onto which is applied three Special Angular Base Unit Milling Heads. The entire machine is hydraulically operated and is actuated electrically to accomplish full automatic cycle. Each milling head has independent motor and control drive for milling 20 pads.

**OTHER MORTON PRODUCTS:** Keyway Cutter and Slotting Machines—Portable Keyway Cutters and Planers and Milling Machines—High Duty Draw-Cut Production Shapers—Flash Trimming Machines—Horizontal Boring, Drilling, Milling Machine and Draw-Cut Traveling Head Planers—Automatic Welding Machines for Submerged and Inert Arc—Special Jigs and Fixtures—Finished Machine Keys including Hi-Pro and Woodruff.

WE INVITE YOUR INQUIRIES

**MORTON MANUFACTURING CO.**

DEPT. O  
MUSKEGON HEIGHTS, MICH.

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**A  
RUTHMAN  
GUSHER  
COOLANT PUMP**

**RIGHT FOR**

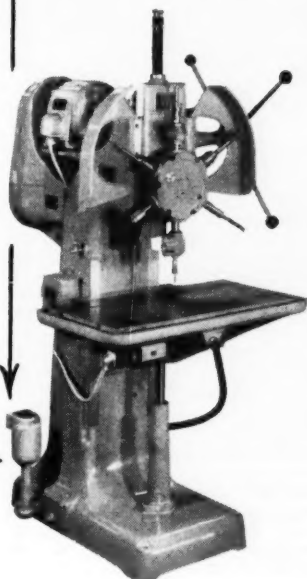
**THE JOB...**

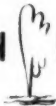
There is a Ruthman Gusher Coolant Pump to meet practically every coolant system requirement, with motor capacities from 1/10 to 2 H. P.

Each model has the same outstanding characteristics; simple construction with fewer parts to wear, dynamically balanced rotating shaft, pre-lubricated heavy-duty ball bearings, automatic priming with no packing foot or relief valves needed.

When you specify Ruthman Gusher Coolant Pumps you're sure they're right for the job. Write today for information on various models available.

Illustrated is a Burgmaster Drill equipped with a Gusher Coolant Pump. Photo, courtesy Burg Tool Co.



**THE RUTHMAN  MACHINERY CO.**

**1817 READING ROAD**

**CINCINNATI 2, OHIO**

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# LASSY TAPPERS

## MODEL 12-F HAND TAPPER

The finest hand tapping machine made. In use in hundreds of shops, universities, experimental rooms and governmental agencies. **GOOD FITS, RIGHT ANGLE HOLES**, tapped to the correct depth with **NO TAP BREAKAGE** are achieved while using unskilled labor.

### LASSY DEPTH GAUGE



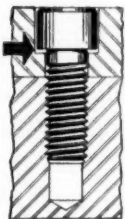
consists of an instantly adjusted gauge ring on the spindle and a scale beside the main bearing. Eliminates guess work. Speeds up tapping and prevents broken taps by showing exactly how deep tap is in work.



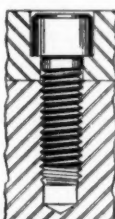
Tap broken by hitting bottom of hole.



Hole tapped crooked. Head of screw does not seat properly; makes assembly difficult.



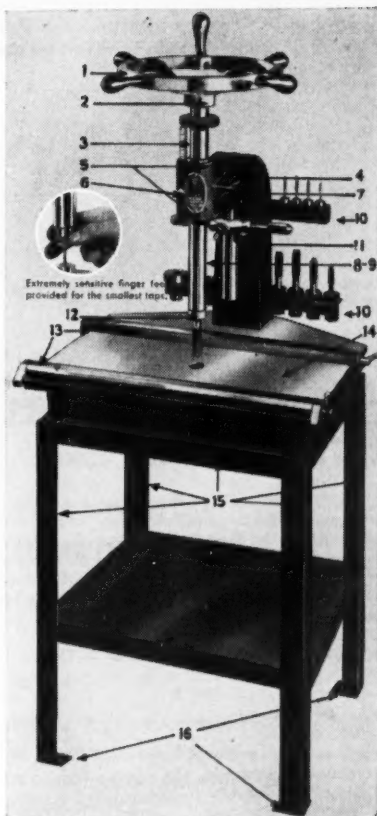
Incorrectly tapped and hard to spot at assembly. Bottom of screw hits.



CORRECTLY tapped hole which you always get with LASSY TAPPERS. Screw head seats properly.

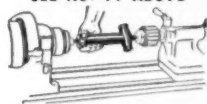
**SEND FOR  
COMPLETE  
LITERATURE**

**LASSY TOOL CO., 90 Bohemia St., Plainville, Conn.**



### LASSY UNIVERSAL TAP & DIE GUIDE

SEE NO. 11 ABOVE



This versatile accessory assures good fits and good threads as the tool is always in line. Guide sliding on pin allows taps and dies to follow correct lead. It can be used with power or by hand. Ideal for all lathe tapping and threading.

A machine carefully designed, **COMPLETE** with direct-reading **DEPTH GAUGE**, quick-change **TAP ADAPTERS**, capacity to 1", pipe taps to 3/4", threading die holders to 1 1/2", **HOLDING BARS**, and our **Universal TAP & DIE GUIDE** for use on lathe or drill press.

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# *Cut cost with...* **VIKING**

*Designed to  
meet today's  
production  
problems*



**DUAL THREAD SCREW  
and WEDGE LOCK are  
incorporated in our  
line:**

Inserted carbide turning and facing tools, face milling cutters, end milling cutters, shell milling cutters. Inserted HSS and carbide side, half side, and interlocking milling cutters.

**VIKING  
TOOL COMPANY  
SHELTON, CONN.**



## **HEAT TREATED ALLOY STEEL SERRATED BODY**

**True dual adjustment** of blades with no auxiliary shims, wedges, etc. Cutter can maintain original diameter and width thru life of blades.

**After maximum regrinds** and repositioning, blades can be "stepped down" and inserted in narrower cutters within same blade thickness series.

**Flat, ground face, serrated, inserted blades.**

**Blades locked** and unlocked in cutter body without hammering blade or wedge.

**Special Designs** of Multiple Cutter Gangs to Customer Specifications.

*Write for free Bulletin B-1*

Also manufacturers of carbide inserted blade single point tools.

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# TORIT DUST COLLECTORS

collecting dust  
is just a  
whirl  
for  
this

cyclone type  
**TORIT DUST  
COLLECTOR**



## TORIT GIVES:

- Easy installation
- Efficiency
- Minimum piping •
- Low operating cost
- Easy cleaning
- Long service life
- Small floor space
- Adaptability
- 10 basic models

No lint or polishing dusts escape to endanger working conditions.

Up to 95% of the dusts spin into the pull-out drawer in the base of this Torit Dust Collector and the remainder is trapped in the after-filter bag.

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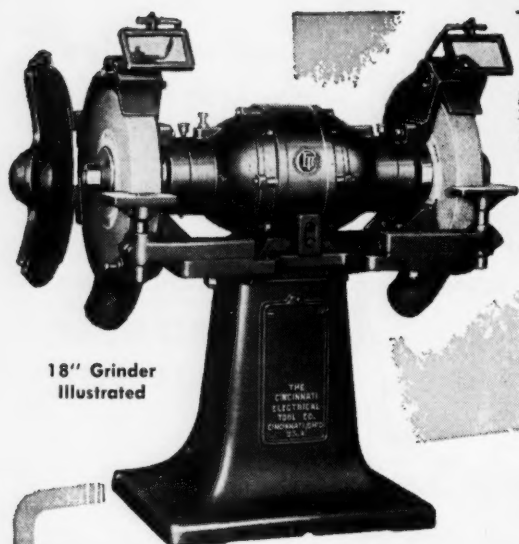
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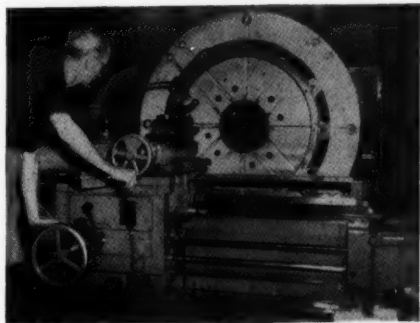


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